2014-1764, 2014-1791

IN THE
UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

KONINKLIJKE PHILIPS N.V. and
PHILIPS ELECTRONICS NORTH AMERICA CORPORATION,

Plaintiffs-Appellants,

v.

ZOLL MEDICAL CORPORATION,

Defendant-Cross Appellant.

Appeals from the United States District Court for the District of Massachusetts in Case No. 1:10-cv-11041-NMG Judge Nathaniel M. Gorton

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REPLY AND CROSS-APPEAL RESPONSE BRIEF OF PLAINTIFFS-APPELLANTS KONINKLIJKE PHILIPS N.V. and PHILIPS ELECTRONICS NORTH AMERICA CORPORATION

J. MICHAEL JAKES
KATHLEEN A. DALEY
ROBERT F. SHAFFER
LUKE J. MCCAMMON
JASON L. ROMRELL
FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP
901 New York Avenue, NW
Washington, DC 20001-4413
(202) 408-4000

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Attorneys for Plaintiffs-Appellants

CERTIFICATE OF INTEREST

Counsel for Plaintiffs-Appellants Koninklijke Philips N.V. and Philips Electronics North America Corporation certify the following:

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

Koninklijke Philips N.V. (formerly Koninklijke Philips Electronics N.V.); Philips Electronics North America Corporation

2. The name of the real party in interest represented by me is:

Koninklijke Philips N.V. (formerly Koninklijke Philips Electronics N.V.); Philips Electronics North America Corporation

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

Philips Electronics North America Corporation is a wholly owned subsidiary of Philips Holding USA, Inc., which, directly and indirectly, is a wholly owned subsidiary of Koninklijke Philips N.V.

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 are:

J. Michael Jakes
Kathleen A. Daley
Robert F. Shaffer
Denise W. DeFranco
Luke J. McCammon
Jason L. Romrell
Rachel L. Emsley
Clara N. Jimenez
David K. Mroz
Susan Y. Tull
Eric C. Jeschke (formerly with Finnegan)
Scott A. Allen (formerly with Finnegan)

Nicholas S. Stroeher (formerly with Finnegan)
FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP

TABLE OF CONTENTS

TABLE OF AUTHORITIES

Page(s)

Cases

Statutes

STATEMENT OF RELATED CASES

There has been no other appeal from the present civil action in this or any other appellate court.

Appeal Nos. 14-1588, 14-1589, 14-1590, 14-1591, 14-1592, 14-1593, 14-1594, and 14-1595 involved the same Philips patents at issue in this appeal or related patents. These appeals were taken from decisions of the Patent Trial and Appeal Board dismissing petitions for inter partes review of the Philips patents. These appeals were consolidated and dismissed on August 25, 2014.

Koninklijke Philips N.V. et al. v. Lifecor Corp., No. 2:12-cv-01369 (W.D. Pa.), could be affected by Zoll's cross-appeal challenging the validity of U.S. Patent No. 5,749,905.

I. ARGUMENT IN REPLY

A. There Is No Legally Sufficient Evidentiary Basis for the Jury's Verdict of No Contributory Infringement

Relying on its "super-jury" rhetoric (Br. 51), Zoll contends that the verdict of no contributory infringement is unassailable. Philips does not dispute it has the burden of showing there is no legally sufficient basis for the jury's verdict. But Philips has carried that burden.

There is no dispute that Zoll knew of Philips's waveform and self-test patents for many years before this suit, and that Zoll received Philips's infringement allegations for both sets of patents in 2008. Notwithstanding this, Zoll argues that it lacked the necessary knowledge of infringement to be liable as a contributory infringer. Zoll's entire argument depends on a critical legal assumption—that Zoll's subjective belief of noninfringement and invalidity can absolve it from years of explicit infringement warnings from Philips. But Zoll's assumption cannot be reconciled with *Aro Manufacturing Co. v. Convertible Top Replacement Co.*, 377 U.S. 476 (1964) ("*Aro II*"), where the Supreme Court found that the "knowledge" required under 35 U.S.C. § 271(c) was definitively established by Aro's receipt of an *allegation* of infringement. Aro's subjective belief was irrelevant to the Supreme Court's contributory infringement analysis, just as Zoll's subjective belief is irrelevant here.

Zoll's other arguments similarly miss the mark. For instance, Zoll has not identified any substantial *noninfringing* uses for its waveform or periodic (i.e., before power on) self-test features. All of Zoll's supposed substantial noninfringing uses are either infringing or are separate and distinct from the infringing features. Zoll's assertion that Philips failed to prove direct infringement by others contradicts not only the unrebutted evidence from trial, but common sense. Try as it might, Zoll cannot brush aside the testimony of its own Vice President of Design Excellence, Donald Boucher, that most of the time customers use Zoll's defibrillators as intended—to defibrillate and run periodic self-tests.

1. Zoll Had the Necessary Knowledge for Contributory Infringement

a. Zoll's Subjective Beliefs Are Irrelevant to Contributory Infringement

Zoll argues the jury could accept Zoll's subjective belief of noninfringement and invalidity as conclusive proof that Zoll lacked the necessary knowledge for liability under § 271(c), despite that Zoll received explicit infringement warnings from Philips as early as 2008. Br. 50-60. Zoll's reliance on its subjective beliefs, however, cannot be reconciled with *Aro II*. There, the Supreme Court treated Aro's receipt of a notice letter conveying the *patentee's* opinion that Aro's conduct was contributing to infringement as conclusively establishing the necessary knowledge. 377 U.S. at 489-90; *see also* Philips Br. 39-40.

Zoll cannot materially distinguish *Aro II* from this case. Contrary to Zoll's assertion that Aro admitted subjective knowledge of infringement, the parties in *Aro II* vigorously contested infringement. *See* Brief for the Petitioners at 29-37, *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476 (1964) (No. 75), 1963 WL 105918, at *29-38. Even the Supreme Court divided five to four on that issue. While the majority in *Aro II* found it "clear" that purchasers of Aro's product had "committed direct infringement," 377 U.S. at 483, the dissent found no infringement, *see id.* at 519-20, 527-29 (Black, J., dissenting). Simply put, it is far from clear that Aro had a subjective belief that the conduct it facilitated constituted infringement. Nonetheless, Aro's subjective belief did not matter to the Supreme Court. What mattered was that Aro had received a letter conveying the patentee's opinion that the conduct constituted infringement.

Zoll's attempt to distinguish *Aro II* highlights why its subjective-belief theory is unworkable. This theory "rests on the proposition that liability for contributory infringement can be avoided when the alleged contributory infringer arrives at its own independent judgment on the legal question of non-infringement." *Nordberg Mfg. Co. v. Jackson Vibrators, Inc.*, No. 63 C 2259, 1967 WL 7708, at *7 (N.D. Ill. Feb. 7, 1967), *rev'd on other grounds*, 393 F.2d 192 (7th Cir. 1968); Zoll Br. 56-58. Under Zoll's theory, a patentee is unprotected until a final judgment of infringement by another. And damages would be

prospective only, since the alleged contributory infringer would not have subjective "knowledge" of infringement until then. As one district court observed, "*Aro II* does not require this odd result" and "cannot be expanded to include the kind of knowledge which [a defendant] claims it did not have: knowledge of a legal conclusion." *Nordberg*, 1967 WL 7708, at *8.

Zoll's reliance on *Global-Tech Appliances, Inc. v. SEB S.A.*, 131 S. Ct. 2060 (2011), is similarly unavailing. After discussing *Aro II*, the Supreme Court in *Global-Tech* held that induced infringement "requires knowledge that the induced acts constitute patent infringement." *Id.* at 2068. But that does not mean that a contributory infringer must have a subjective belief that liability for infringement would result. Zoll's interpretation of *Global-Tech* cannot be squared with *Aro II*, which similarly stated that contributory infringement requires knowledge that a combination "was both patented and infringing," but then proceeded to hold that the mere receipt of a notice letter from the patentee left no room for a belief-based defense. *Aro II*, 377 U.S. at 488-90. Thus, *Aro II* ties the knowledge requirement for contributory infringement to knowledge of the patent and the potentially infringing conduct at issue—not to whether a defendant might subjectively believe it can escape liability.

This Court's decision in *Commil USA, LLC v. Cisco Systems, Inc.*, cannot save Zoll's subjective-belief theory. 720 F.3d 1361 (Fed. Cir. 2013), *cert. granted*,

135 S. Ct. 752 (2014). The majority opinion in *Commil* makes no mention of contributory infringement. Rather, it held that "a good-faith belief of invalidity is evidence that may negate the *specific intent* to encourage another's infringement, which is required for *induced* infringement." *Id.* at 1368 (emphases added). Contributory infringement, however, does not have the same specific intent requirement.[1] *See Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469 (Fed. Cir. 1990) (holding that "only proof of a defendant's *knowledge*, not *intent*, that his activity cause infringement [is] necessary to establish contributory infringement"); *see also* Philips Br. 40. There is also no basis for extending *Commil* to contributory infringement. The Supreme Court's holding in *Aro II* that "the Court's interpretation of the knowledge requirement affords Aro *no defense*" necessarily establishes that whatever good-faith belief of invalidity (or noninfringement) that Aro may have had was irrelevant to the contributory infringement.[2] *Aro II*, 377 U.S. at 490-91 (emphasis added).

[1] Zoll asserts that Philips's decision not to appeal the verdict of no induced infringement somehow confirms that Zoll lacked the required knowledge for contributory infringement. Br. 60. But these are two separate issues—the "state of mind" required for induced infringement is not the same as the knowledge required for contributory infringement. *See, e.g.*, *Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd.*, 545 U.S. 913, 932 (2005) (explaining that intent is "presumed" under § 271(c)).

[2] The Supreme Court contemplated the possibility of invalidity in the *Aro* cases, yet Aro's invalidity belief was irrelevant to the contributory infringement analysis. In fact, Justice Black noted in his dissenting opinion in *Aro II* that he (continued…)

b. Zoll Knew of Philips's Claim that Zoll Infringed the Waveform and Self-Test Patents in 2008

Under the proper legal standard, there was no evidence negating Zoll's knowledge of infringement for the jury to weigh. Zoll's CEO, Richard Packer, admitted that Zoll received and understood Philips's infringement allegations for the waveform and self-test patents in 2008. A1958:24-1959:11; A1978:16-1980:1; *see also* Zoll Br. 7 (admitting that Philips approached Zoll about its patents in 2008). That admission alone establishes the knowledge needed for contributory infringement under *Aro II*.

Zoll's narrative of Philips's supposed "long delay" in bringing suit does not change Zoll's knowledge of infringement in 2008. Section 271(c) requires that the contributory infringer know of the patent and infringement—how long *Philips* knew of Zoll's infringement is irrelevant. Moreover, the district court rejected Zoll's allegations of laches and equitable estoppel, which Zoll did not appeal. A8; A19-44.

Zoll also argues that it lacked the required knowledge for contributory infringement because Philips's initial infringement allegations included other patents that were either never asserted or were dropped. Br. 5-56. But *Aro II* only

(…continued)
discussed "the doubtful validity of this combination patent" in *Aro I*. 377 U.S. at 523 n.6.

requires knowledge of the waveform and self-test patents, and knowledge of Philips's infringement allegations. 377 U.S. at 488-90. It is irrelevant that Philips chose to streamline its case by dropping certain patents.

Zoll also argues that it cannot be liable for contributory infringement before 2009 for its AEDs and 2012 for its hospital defibrillators. But the jury was never asked to determine the date of first infringement, which ultimately goes to damages and will be tried separately. Even if the date of first infringement were at issue in this appeal, Zoll's 2009 date is contradicted by unrebutted evidence. Mr. Packer admitted that Zoll received Philips's infringement allegations for both the waveform and self-test patents *in 2008*. A1958:24-1959:11; A1978:16-1980:1. Philips's later correspondence maintained those allegations. A1979:1-1980:4.

Zoll tries to quarantine its knowledge of AED infringement from its knowledge of hospital-defibrillator infringement. The accused features, however, are common to both product lines, and Zoll necessarily knew that its waveform and periodic self-test features infringed in 2008. Indeed, Mr. Packer admitted that "[e]very new defibrillator that [Zoll has] brought out since [1999] has used the rectilinear biphasic waveform." A1958:17-23. Likewise, the periodic self-tests in Zoll's R Series hospital defibrillator and the periodic self-tests in Zoll's AED products share an almost identical description in Zoll's documentation. A1860:17-1867:7; A7056; A12148; A12363.

Under the rule of *Aro II*, there is no legally sufficient basis for a jury to find that Zoll did not have knowledge of the waveform and self-test patents or their infringement.

2. Zoll's Defibrillation and Periodic Self-Test Features Have No Substantial Noninfringing Uses

Abandoning its closing argument where it identified noninfringing uses as "pacemaking," "monitoring," and "blood oxygen sensing" (A5231:16-19), Zoll now alleges only one substantial noninfringing use for its defibrillation feature. Zoll argues the jury could have concluded that Zoll's rectilinear waveform is a substantial noninfringing use of its defibrillation feature because the entire energy amount is not discharged "across the electrodes" due to resistors in the DAC absorbing part of the energy (i.e., creating an impedance). Br. 63.

Zoll's construction of "across the electrodes" cannot be correct. Of the asserted waveform claims, only claim 5 of U.S. Patent No. 5,836,978 (which is not at issue in Philips's appeal) requires any particular waveform shape—biphasic truncated exponential. A420. Claim 51 of the '454 patent (A376) and claims 4 and 8 of the '905 patent (A391) are not limited to any particular waveform shape and do not preclude resistors between the electrodes and the capacitor. *See Free Motion Fitness, Inc. v. Cybex Int'l, Inc.*, 423 F.3d 1343, 1353 (Fed. Cir. 2005) ("Basic patent law holds that a party may not avoid infringement of a patent claim using an open transitional phrase, such as comprising, by adding additional

elements."). In fact, claim 51 of the '454 patent expressly *requires* "an additional impedance" (e.g., resistors) in the path between the capacitor and the patient. A376; A1756:20-1759:4. Zoll cannot rewrite the claims to support the jury's verdict. *See K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1364 (Fed. Cir. 1999).

Zoll also overlooks that, in finding direct infringement of the waveform patents, the jury had to reject Zoll's argument that waveforms using the DAC do not infringe. At trial, Zoll argued that its DAC feature precluded *any* infringement, regardless of the specific waveform generated. A2620:19-2621:18; A2632:2-14; A2633:2-13; A2634:6-13; A2634:24-2635:6; A5226:1-5228:17. Put another way, Zoll did not limit its DAC noninfringement argument to its rectilinear waveform only. In fact, contrary to Zoll's argument (Br. 62-63), Zoll made the same DAC noninfringement argument for claim 5 of the '978 patent, which is expressly limited to a biphasic truncated exponential waveform. A2633:2-13; A2634:14-23; A420. The only evidence presented at trial was that Zoll's defibrillators always use the DAC. A2437:17-2438:14; A2616:1-14; A2620:19-24. Nevertheless, the jury found that Zoll's defibrillators directly infringe claim 51 of the '454 waveform patent and claims 4 and 8 of the '905 waveform patent, necessarily rejecting Zoll's DAC noninfringement argument.

A "single" schedule for Zoll's periodic self-tests fares no better as a substantial noninfringing use. Br. 63-64. Only claim 7 of the '460 patent claims a

"first" and a "second periodic schedule." A406. But claims 42, 67, and 68 of the '374 patent (A436-37) do not have the same requirement and are still infringed even when Zoll's periodic self-tests are run on a single periodic schedule. Zoll's expert, Dr. Halperin, agreed at trial that "there's absolutely no dispute between the parties that Zoll defibrillators infringe directly the automatic and periodic self-test claims of 42, 67, and 68 of the '374 patent." A2909:18-2910:9. Once again, Zoll's argument rests on an allegedly "substantial noninfringing use" that infringes.

Zoll's final alleged substantial noninfringing use is a self-test performed as part of a manual "power-on" procedure, as opposed to an automatic self-test before power on. Br. 63-64. These are two distinct features. Mr. Packer admitted that Zoll first added a periodic self-test feature to its defibrillators in 2002, which also had power-on self-tests, because, "in that market where you are going to have a defibrillator that is stationed someplace and there isn't a user that's expected to interact with it, . . . it doesn't make sense to expect a manual test to be performed on a regular basis." A1943:11-21. This unrebutted testimony conclusively established that periodic self-tests were an added feature, separate and distinct from the older manual power-on self-tests. Zoll cannot "escape liability as a contributory infringer merely by embedding [the infringing feature] in a larger product with some additional, separable feature." *Ricoh Co. v. Quanta Computer Inc.*, 550 F.3d 1325, 1337 (Fed. Cir. 2008).

The only legally sufficient evidence presented at trial was that there are no noninfringing uses for Zoll's waveform and periodic self-test features.

3. Mr. Boucher's Unrebutted Testimony Established that Customers Use Zoll's Defibrillators to Infringe the Waveform and Self-Test Patents

Zoll fails to identify any evidence that customers do not use Zoll's defibrillators to shock patients, or that customers deactivate the periodic self-tests in Zoll's defibrillators. Instead, Zoll recycles its "substantial noninfringing use" theories in arguing that customers might have *exclusively* used certain defibrillation waveforms and self-test schedules that, according to Zoll, do not infringe Philips's patents. Br. 65-67. But Zoll is wrong—Zoll's rectilinear waveform infringes, as do periodic self-tests running on a single periodic schedule.

Zoll does not dispute that it configures its defibrillators to run periodic self-tests automatically by default when shipped. Br. 28; *see also* A1899:3-1900:5; A7055-58; A12139; A12148; A12220; A12361-63. Nevertheless, Zoll argues that its customers might have completely deactivated those periodic self-tests, instead relying exclusively on the separate and distinct manual power-on self-tests.

Zoll's argument defies unrebutted evidence and common sense. As an initial matter, Zoll cites no evidence showing that the before-power-on self-test can be turned off or disabled in the AED Plus or AED Pro and cites no evidence that any customer has ever deactivated a before-power-on self-test. But even if some

customers could and did deactivate the self-tests, Zoll's argument still falls short. The unrebutted evidence established not just that Zoll's products are "capable" of running admittedly infringing self-tests, but that "[m]ost of the time," customers actually "use Zoll's products as they're intended to be used." A2483:5-24; A1899:22-1900:5. And Zoll's own documentation unequivocally established that Zoll intends for its defibrillators to run periodic self-tests automatically before power-on, which infringe.

Mr. Boucher's testimony similarly established that customers use Zoll's defibrillators to infringe the waveform patents. Zoll also intends for customers to use its defibrillators to defibrillate.[3] Zoll Br. 5-7; A1958:17-23; A2483:22-24. That most of the time Zoll's customers use Zoll's defibrillators as intended is more than enough evidence to carry Philips's burden. A2483:22-24. Mr. Packer also testified that "Zoll enjoys about a 50 percent market share" in North American hospitals, and about a 40 percent share of the ambulance market. A1935:6-11.

In light of this evidence, no reasonable juror could conclude that no customer has ever used a Zoll defibrillator to defibrillate, or that no Zoll customer has ever allowed a Zoll defibrillator to continue running periodic self-tests, which

[3] Evidence at trial also showed that Dr. Roger White, M.D., has used at least two Zoll defibrillators—the AED Plus and the M Series—to shock patients. A8479-88.

are programmed to run automatically by default when the defibrillator is shipped. *See, e.g.*, *Lucent Techs, Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1317 (Fed. Cir. 2009) (holding that "a finding of infringement can rest on as little as one instance of the claimed method being performed during the pertinent time period"). "[T]he evidence, together with all reasonable inferences in favor of the verdict, could lead a reasonable person to only one conclusion"—that Philips is entitled to a judgment of contributory infringement as a matter of law. *Lama v. Borras*, 16 F.3d 473, 477 (1st Cir. 1994) (citation omitted).

B. The '526 Patent Is Invalid as a Matter of Law for Indefiniteness or a New Trial on Validity Is Warranted

1. Zoll's '526 Patent Is Indefinite

a. No Reasonable Jury Could Have Ignored the Test Data Showing Indefiniteness

Zoll does not dispute that changes in temperature can lead to an electrode that is both infringing and not infringing, which makes the claims indefinite. Instead, Zoll asserts that the jury found in its favor based on an argument that has no evidentiary support.

Zoll argues that the jury could have rejected the tests Philips's expert performed showing the effect temperature has on electrode-gel impedance because he used a 150 Joule shock instead of a 200 Joule shock, but Zoll cites no evidence that would allow a reasonable jury to discount that testing. Br. 69. Philips's expert explained that the outcome of the claimed test does not change if 150 Joules is

used instead of 200, noting that "energy does not really change impedance significantly. It remains the same." A5073:7-5074:4. He corroborated this testimony with objective test data confirming that the change in energy level does not significantly affect the outcome of the claimed test. A12101-09. This testimony was unrebutted—Zoll presented no evidence that using 150 Joules would change the outcome of the claimed test. Thus, no reasonable jury could have rejected Philips's tests on the basis that the expert used a 150 Joule shock. *See Oracle Am., Inc. v. Google Inc.*, 750 F.3d 1339, 1379 (Fed. Cir. 2014) (holding that, in light of "unrebutted testimony at trial," "a reasonable jury could not have found" contrary to that testimony).

Zoll next argues that this is simply a case of "competing test results" and that the jury could have accepted Zoll's expert's tests. Br. 70. But there were no competing results. Zoll's expert tested the accused electrodes at one temperature. A2337:22-2338:2. Philips's expert tested electrodes over multiple temperatures to show that temperature significantly affects the results of the claimed test, making the claims indefinite.[4] A12110; A12011-50. Zoll's expert had no competing test

[4] Zoll also states that Philips's expert's test results showed resistances of greater than 1Ω when he "performed his tests at the claimed 200 Joules." Br. 69. This is incorrect, as those tests were not performed at 200 Joules. Instead, a 150 Joule shock was used, just like the other tests at varied temperatures. *See* A12011-42. The results showed the effect temperature has on the claimed test. Testing at 15ºC resulted in a higher resistance (above 1Ω) simply due to the lower (continued…)

results to dispute this fact. Indeed, Zoll's expert admitted that he only tested the electrodes at one temperature, and at no point did he contest that temperature can significantly affect the claimed test. A2337:22-2338:20. Quite the contrary, he admitted that changes in temperature could lead to both noninfringing and infringing results. A5165:15-22. Thus, the claimed test can result in an electrode being both infringing and not infringing based merely on the temperature at which the test is performed. This is "the epitome of indefiniteness." *Geneva Pharm., Inc. v. GlaxoSmithKline PLC*, 349 F.3d 1373, 1384 (Fed. Cir. 2003).

b. Zoll Failed to Address Shock Count and Electrode Age

For shock count and electrode age, Zoll fails to address the indefiniteness inquiry entirely. Instead, Zoll focuses on whether the particular accused electrodes in this case were infringing (Br. 71-72), but that is not the proper analysis. The Supreme Court noted in *Nautilus, Inc. v. Biosig Instruments, Inc.*, that one of the primary goals of the definiteness requirement is that "a patent must be precise enough to afford clear notice of what is claimed, thereby 'appris[ing] the public of

(…continued)
temperature. A12110; A12015-18. And at 28ºC, due to the increase in temperature, the result drops to below 1Ω, where the product was no longer infringing. A12110; A12039-42. This corroborates the evidence presented at trial and shows that whether a product infringes or not can be manipulated based on the temperature chosen.

what is still open to them.'" 134 S. Ct. 2120, 2129 (2014). Zoll does not address whether the claims are precise enough to serve their public-notice function.

At trial, Philips introduced evidence showing that the number of shocks over which an electrode is tested can significantly affect the results. Philips Br. 28-29. Zoll's expert admitted that one of ordinary skill in the art could perform the claimed test with any number of shocks up to ten, and test data shows that a product can be both infringing and noninfringing based solely on the number of shocks chosen. A2354:7-17; A11321-22. Zoll does not dispute the test data—Zoll performed the tests. A5078:15-5079:10; Zoll Br. 71. Zoll also does not dispute that the shock count alone can make an electrode infringing or noninfringing. *See* A11321-22. Instead, Zoll responds that it chose not to accuse that particular electrode of infringement.[5] Br. 71. But a patentee cannot avoid indefiniteness by drafting vague claims and simply choosing not to accuse products that expose that ambiguity. The Supreme Court rejected this type of gamesmanship, noting that "patent applicants face powerful incentives to inject ambiguity into their claims" where there is not "a meaningful definiteness check." *Nautilus*, 134 S. Ct. at 2129.

[5] Zoll characterizes the product as noninfringing because it "indicated resistances under 1Ω in several measurements." Br. 71. But the same product also had resistances *over* 1Ω in several measurements, which is precisely what makes the '526 patent's claims indefinite. A11321-22.

Zoll similarly does not address the effect age has on an electrode other than noting that the electrode should be tested within the electrode's shelf life. Br. 72. The undisputed evidence at trial was that electrode resistance increases with age, even within the electrode shelf life. A11292. Zoll's own test data shows that this increase is significant, and Philips's expert testified that this factor can affect whether the resistance is above or below 1Ω. *Id.*; A5083:23-5084:10. This would leave a competitor with no choice but to avoid even resistances well below the 1Ω limit or else "enter only at the risk of infringement claims." *Nautilus*, 134 S. Ct. at 2129 (citation omitted). Thus, the claims of the '526 patent create the very "innovation-discouraging zone of uncertainty" that the Supreme Court held the definiteness requirement was meant to alleviate. *Id.* at 2130 (citation omitted).

2. A New Trial Is Warranted Because the District Court Instructed the Jury that It Could "Only" Apply the Insolubly Ambiguous Standard

Zoll requested that the district court instruct the jury that the "only" way the jury could find the '526 patent's claims indefinite was if they were "insolubly ambiguous." Specifically, Zoll's proposed jury instructions included: "Absolute clarity is not necessary; rather, only claims that are insolubly ambiguous are indefinite." A20442-43. In its closing, Zoll again emphasized that Philips's invalidity claim could only succeed if the claims were insolubly ambiguous, telling the jury that "Zoll's patent is valid unless it's either insolubly ambiguous or it

would require what's called 'undue experimentation.'" A5217:21-24. Despite demanding this instruction, Zoll now appears to agree that the instruction was improper. It argues that there was no prejudice because the "question for the jury was *not* whether any term in the '526 patent claims were too ambiguous to be amenable to construction." Br. 74 (emphasis added). But this only further shows the prejudice to Philips, as the jury was instructed multiple times that the *only* way it could find in Philips's favor was based on a test that is both inapplicable to this case[6] and has been overruled by the Supreme Court.

The remainder of the instruction does not save Zoll. Even with additional context, the instruction makes perfectly clear that "only claims that are insolubly ambiguous are indefinite." A5336:15-16. Thus, Zoll's argument that the jury ultimately applied the correct standard is necessarily premised on an assumption that the jury ignored the instruction that *only* insolubly ambiguous claims are indefinite. That is contrary to law. *Morales-Vallellanes v. Potter*, 605 F.3d 27, 34-35 (1st Cir. 2010) (noting that "'[a] basic premise of our jury system is that the jury

[6] Philips objected to Zoll's proposed instruction on indefiniteness, arguing that this case is not about "whether something is insolubly ambiguous." A5340:19-24. At that time, Zoll disagreed and insisted that the instruction include the insolubly ambiguous instruction, arguing "[i]ndefiniteness is either insolubly ambiguous or it's a showing of undue experimentation." A5342:6-7. It is only now that the Supreme Court has overruled the insolubly ambiguous standard that Zoll admits the standard is inapplicable to this case in an attempt to minimize its impact on the jury.

follows the court's instructions,' and therefore we assume, as we must, that the jury acted according to its charge" (citation omitted)). Because the jury could have only applied the wrong legal standard, the Court should order a new trial on validity.

3. A New Trial Is Warranted Because the District Court Erred by Excluding Evidence of Prior Art

a. The District Court Improperly Excluded Evidence of the Prior-Art Marquette 1200 Electrode

At trial, Zoll objected to Philips's use of two 510(k) submissions, arguing that they contained inadmissible hearsay and Philips had not laid a proper foundation for the documents. A3006:22-3007:11. The district court then ordered simultaneous briefing on the issue. A3007:15-19. Zoll exceeded the scope of the briefing and for the first time argued that the documents did not qualify as prior-art printed publications. A5940-41. Philips had no chance to respond to this point, and the district court ruled that the documents did not qualify as prior art. A5005:2-11. But now that Zoll has to defend this ruling, it distances itself from its previous arguments. Zoll now argues that the "District Court had previously ruled that Philips had failed to establish proper foundation" for the 510(k) submission describing the Marquette 1200 electrode.[7] Br. 75. This is not true. The court

[7] Zoll also incorrectly states that Philips offered "two third-party 510(k) submissions" to establish the operation of the Marquette 1200 electrode. Br. 75. (continued…)

clearly stated that the offered 510(k) "notifications are not prior art under the Patent Act." A5005:2-11. It made no ruling based on lack of foundation.[8]

Zoll next argues that the district court found that the offered 510(k) submissions were not "prior art 'printed publications.'" Br. 75. But that is precisely Philips's point. Philips was not relying on the Marquette 510(k) as a printed publication—it was relying on the Marquette 1200 electrode as a prior-art *device*. *See* Philips Br. 61-62; A5009:16-22. Philips was prepared to present evidence showing that the *device* qualified as a prior-art product, but the court disallowed any testimony relying on the 510(k) describing that device. A5005:2-11; A5009:16-22.

Notably, Zoll has not contested that the Marquette 1200 product qualifies as prior art. Instead, it argues that, even if the 510(k) "constitutes evidence of the features of the Marquette 1200, it was properly excluded as containing

(…continued)
While Philips did offer two 510(k) submissions, they relate to different prior-art references. One of the 510(k) submissions was submitted to the FDA by Marquette Electronics and described the operation of the Marquette 1200 electrode prior-art *device*. A5629-75. The other 510(k) submission was a public version of a 510(k) application related to the Physio-Control Fast-Patch electrode, which qualified as a *printed publication*. A5585-628.

[8] Zoll initially moved in limine to exclude these documents for lack of foundation. The district court denied Zoll's motion, holding that, "[i]f a proper foundation is laid, Doctor Efimov may testify as to whether the Food and Drug Administration Form 510(k) notifications anticipate Zoll's inventions and may rely on the Form 510(k) notifications for other non-hearsay purposes." A1007:12-16.

inadmissible hearsay." Br. 76 (citation omitted). But, again, this is incorrect. This evidence was *not* excluded as hearsay. For Zoll to now request that this Court decide factual issues related to whether the document is excludable hearsay is inappropriate. *See United States v. Trenkler*, 61 F.3d 45, 57 (1st Cir. 1995) ("[W]hether or not particular evidence may be admitted under the residual hearsay exception is a fact-specific inquiry committed in the first instance to the sound discretion of the district court."). There are numerous hearsay exceptions that the Marquette 1200 510(k) falls under, and Philips should have the opportunity to present relevant facts to the district court for a proper ruling on the document's admissibility. A20435-38.

b. The District Court Improperly Excluded the Physio-Control Fast-Patch 510(k) Printed Publication

Zoll defends the district court's exclusion of the Fast-Patch 510(k) by arguing that there is no evidence that the information was disseminated before the filing date of the '526 patent. Br. 76. But that is not the correct test for whether a document is a printed publication. Indeed, this Court has held that "[i]f [a publication's] accessibility is prove[n], there is no requirement to show that particular members of the public actually received the information." *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1569 (Fed. Cir. 1988). In its opening brief, Philips discussed the FDA regulations that show the Fast-Patch

510(k) was available for public disclosure before the '526 patent filing date. Philips Br. 63-64. Zoll does not address this. The applicable regulations show the Fast-Patch 510(k) was available for public disclosure before the '526 patent was filed, and thus its exclusion was prejudicial error.

II. ARGUMENT IN RESPONSE TO ZOLL'S CROSS-APPEAL

A. Standard of Review

When analyzing whether a district court properly denied a motion for judgment as a matter of law, the law of the regional circuit applies. *Integrated Tech. Corp. v. Rudolph Techs., Inc.*, 734 F.3d 1352, 1356 (Fed. Cir. 2013). Zoll confuses the standard of review by citing cases where this Court relied on the substantial evidence standard of review from circuits other than the First Circuit. Br. 12-14. But the First Circuit determines whether "viewing the evidence in the light most favorable to the verdict, a rational jury could have found in favor of the party that prevailed." *Cortés-Reyes v. Salas-Quintana*, 608 F.3d 41, 47 (1st Cir. 2010) (citation omitted). The First Circuit enters judgment as a matter of law when "the presentation of the party's case reveals no 'legally sufficient evidentiary basis' for a reasonable jury to find for that party." *Mag Jewelry Co. v. Cherokee, Inc.*, 496 F.3d 108, 117 (1st Cir. 2007) (citation omitted).

B. Summary of Argument

For its cross-appeal, Zoll takes a shotgun approach, raising numerous issues but failing to show the jury had legally insufficient evidence for reaching its

verdicts. Zoll appeals the infringement verdict for both the self-test and waveform patents. But for the self-test patents, Zoll did not contest infringement at trial and, in any event, the evidence established that Zoll's defibrillators practice every step of the claims and that Zoll directly infringed by product testing and by selling a device that automatically infringes. For the waveform patents, Zoll challenges the district court's construction of the "during the discharge" limitation, raising a new construction on appeal. But the district court's construction is fully supported and Zoll infringed even under its new construction. Moreover, there was ample evidence showing that Zoll directly infringed the waveform patents.

For validity, Zoll raises issues it barely addressed at trial. For example, Zoll's expert glossed over whether the VivaLink brochure discloses the "fail-safe visual display" in claim 43 of the '374 patent. It does not and the brochure, which is a four-page promotional brochure with a brief one-paragraph description of the self-testing features, is not enabling. Zoll's anticipation argument for claim 7 of the '460 patent also fails because Wiley does not disclose two separate self-tests on two separate schedules. Zoll's argument that claims 42, 67, and 68 of the '374 patent would have been obvious also misses the mark. The claimed self-test that took place automatically before the defibrillator was powered on was a groundbreaking invention that made public-access defibrillators possible. On appeal, Zoll relies on the same type of prior art overcome during prosecution, and

the jury had ample evidence to support its verdict of no invalidity. Zoll's challenge to the validity of the '905 patent is similarly unfounded. The Kroll patent does not anticipate the '905 claims because it does not disclose "shaping the waveform so that an initial parameter of a waveform phase depends on a value of the electrical parameter."

C. The Jury's Verdict that Zoll Infringed the Self-Test and Waveform Patents Should Be Upheld

1. Zoll Directly Infringed the Self-Test Patents

At trial, Philips presented evidence showing that Zoll's defibrillators automatically perform each limitation of claims 42, 67, and 68 of the '374 patent and claim 7 of the '460 patent and that Zoll infringed by performing the claimed methods during product testing. A1842:8-1853:25; A1854:5-1867:7; A1897:18-1899:2. Zoll responded by doing *nothing*—it offered no evidence rebutting Philips's infringement case for those claims. To the contrary, Zoll's expert admitted that Zoll's defibrillators directly infringed. A2909:18-2910:9. Thus, Zoll asks this Court to reverse a jury verdict on an issue it never addressed at trial.

a. Zoll Infringed the Self-Test Method Claims During Product Testing

At trial, Dr. Efimov showed that Zoll directly infringed the self-test method claims by testing the automatic, periodic self-test feature in its defibrillators. In forming his opinion, Dr. Efimov relied on deposition testimony from Donald Boucher, Zoll's Vice President of Design Excellence, whose "primary

responsibility" is to test Zoll products and "verify[] that they do what we want them to do." A2410:18-2411:10. Mr. Boucher explained that, before Zoll sold defibrillators to customers, it "did validation testing or verification testing using a defibrillation analyzer to make sure the features and functionalities were working properly." A1897:18-1898:11.

Dr. Efimov also relied on a test report for the R Series defibrillator showing that the automatic, periodic self-test feature is in fact a feature that can be and is tested. A13615-19; A13775-76; A1898:13-1899:2. Two entries in this report state: "Test on DEFIBRILLATOR supplied with an automatic wake-up self-test with pre-selectable intervals when the DEFIBRILLATOR is powered off performed with the wake-up self-test enabled at the shortest possible interval." A13775-76. The entries also explain that "[t]he defib pads were . . . shorted to deliver 30J self-test." *Id.* Relying on this evidence, Dr. Efimov concluded that "Zoll actually conducted . . . tests which infringe [the self-test method claims] before shipping it to the customers." A1898:12-16.

Zoll rebutted *none* of Dr. Efimov's testing evidence. Zoll never addressed the issue during cross-examination or closing argument. And neither Dr. Halperin nor any other Zoll witness challenged Dr. Efimov's reliance on Mr. Boucher's testimony or the R Series test report. In fact, at trial Mr. Boucher provided additional testimony supporting Dr. Efimov's opinions:

> Q: [Y]ou make sure that *all* the features and functionalities of Zoll's devices are working properly, don't you?
>
> MR. BOUCHER: Yes, we do.
>
> Q: And you do that in all of the accused products. . . .
>
> MR. BOUCHER: That testing process applies to all of our products, yes.
>
> Q: You do in-house testing to test the features and functionality of the products, correct?
>
> MR. BOUCHER: Yes.
>
> * * *
>
> Q: . . . You're very confident when you send your products to customers that it's going to work as you intended, that the self-test functionality is going to work as intended, correct?
>
> MR. BOUCHER: We're reasonably confident.
>
> Q: Okay. And that's because you do some testing of the product, right, including the self-test functionality, right?
>
> MR. BOUCHER: We do some testing, yes.

A2481:20-2483:16 (emphasis added).

Zoll argues that Mr. Boucher's testimony was too general to show that Zoll tested the periodic self-test feature. Br. 26-28. Zoll takes Mr. Boucher's testimony out of context, however, when arguing that only "some testing" of the accused products is performed and that Zoll does not test "every single little thing that's in the product," although Zoll never stated that it does not test the periodic self-test

feature. Br. 27-28. Zoll also lists specific limitations from the self-test method claims that it believes are not supported by evidence of testing. Br. 28.

Zoll's arguments fail. First, Zoll's suggestion that the periodic self-test feature might qualify as one of the "little thing[s]" not tested has no support in the record and is contradicted by the testimony of Zoll's CEO. Mr. Packer explained that this feature was so significant that it allowed Zoll to enter an entirely new market—the public-access defibrillator market "where you are going to have a defibrillator that is stationed someplace and there isn't a user that's expected to interact with it." A1943:11-21; *see also* A1936:18-1937:11; A1939:17-23. Zoll also prominently features periodic self-tests in its manuals. A7058; A12148; A12363.

The jury could have viewed this evidence in context with Mr. Boucher's representations that (1) Zoll performs tests "mak[ing] sure that *all* the features and functionalities of Zoll's devices are working properly" (A2481:23-2482:1 (emphasis added)); (2) Zoll "tests the self-test functionality before the product is delivered to customers" (A2482:19-23); (3) and he is "reasonably confident" that, when products are shipped to customers, "the self-test functionality is going to work as intended" because Zoll does "some testing" (A2483:5-16), to conclude that Zoll tested the periodic self-test feature in Zoll's defibrillators. Such a

conclusion is further supported by the R Series test report showing that Zoll's periodic self-test feature is capable of being tested and was tested.[9] A13775-76.

Zoll's argument that specific limitations from the self-test method claims are not supported by evidence of testing also lacks merit. Br. 28. Philips presented unrebutted testimony showing that Zoll's defibrillators automatically practice each element of the self-test method claims by running the automatic, periodic self-test feature. *See supra* § II.C.1. It follows that when testing this feature, Zoll necessarily practices every element in the self-test method claims, and thus directly infringes.

b. Zoll Infringed the Self-Test Method Claims Under *SiRF*

The jury's infringement verdict should be upheld for another reason—the evidence shows that Zoll infringes the self-test method claims under *SiRF Technology, Inc. v. International Trade Commission*, 601 F.3d 1319 (Fed. Cir. 2010). *SiRF* involved method claims "drawn to actions . . . performed by a single party." *Id.* at 1329. The claims did not require end users to perform any of the

[9] Zoll argued post-trial that the R Series test report did not involve testing performed by Zoll. But the report shows that the testing was performed *for Zoll*. The jury was free to conclude that Zoll controlled this testing. Zoll provided no evidence to the contrary. Indeed, the testing occurred in Chelmsford, Massachusetts, where Zoll is headquartered and manufactures defibrillators. A13615-18.

steps. *Id.* The accused infringer, SiRF, made and sold products that, once enabled by the customer, performed all steps of the claimed method automatically. *Id.* at 1331. Because "SiRF perform[ed] all of the claim limitations," it "directly infringe[d]." *Id.* Notably, customer actions were necessary to facilitate the infringing device's automatic performance of the method steps, but this Court still found infringement because those customer actions were not covered by the claims. *Id.* at 1330-31.

Like the claims in *SiRF*, the self-test method claims require no participation by an end user. And like the accused products in *SiRF*, Zoll's defibrillators automatically perform all claimed steps on their own. *See supra* § II.C.1. These defibrillators are configured to run periodic self-tests when they are shipped from Zoll's factory. A1899:3-21. Thus, when the user receives the defibrillator, the infringement occurs automatically and without user intervention. *See SiRF*, 601 F.3d at 1329-31.

Relying on *Ericsson, Inc. v. D-Link Systems, Inc.*, 773 F.3d 1201 (Fed. Cir. 2014), Zoll argues that the sale or manufacture of equipment that performs a claimed method cannot constitute direct infringement. Br. 22-23. In *Ericsson*, this Court explained that "none of our decisions have found direct infringement of a method claim by sales of an end user product which performs the entire method." *Ericsson*, 773 F.3d at 1222. The *Ericsson* Court distinguished *SiRF* on the grounds

that two steps in the *SiRF* claims were performed by a satellite controlled by the accused infringer while the customer used the accused product. *Id.* at 1221-22.

The facts of this case fall under *SiRF*, not *Ericsson*. This is not a garden-variety case where a product is shipped to a user who then actively initiates infringement of method claims by using a product. Zoll's defibrillators are preset to infringe when they are shipped from Zoll's factory. A1899:3-21. And the jury saw evidence that Zoll's defibrillators infringe *during shipment*. The self-test section of Zoll's R Series manual states that, "[w]hen the R Series device ships from ZOLL, the Code Readiness indicator may show a red 'X.'" A12361. A jury could have understood this statement to mean that the Code Readiness indicator may also show a green √ when it ships (it must show one or the other) (A12262), which would mean that the self-test feature is active and infringing. Thus, in addition to directly infringing through product testing, Zoll directly infringes under *SiRF* by manufacturing and shipping already-infringing products to its customers. Either way, the jury verdict is supported by legally sufficient evidence.[10]

[10] *SiRF* further supports the jury verdict because the jury answered yes to the question of whether "Philips prove[d] by a preponderance of the evidence that *ZOLL's defibrillators* directly infringe[d]" the self-test method claims. A105-06 (emphasis added).

2. Zoll Directly Infringed the Waveform Patents

a. Zoll Infringed Through Product Testing

Zoll appeals the jury's verdict of infringement (A108-09; A111) of the waveform method claims—claim 51 of the '454 patent and claims 4 and 8 of the '905 patent. Br. 23-25. But any time Zoll's defibrillators deliver a shock or discharge, each step of the waveform method claims is performed. A1685:5-1686:8. Zoll's defibrillators cannot deliver a noninfringing waveform. A1686:3-12. Thus, if Zoll at any point discharged one of its defibrillators, they would have directly infringed the method claims. Here, Philips presented substantial evidence that Zoll tested and operated its defibrillators. *See supra* § II.C.1.a. Zoll's witnesses testified about testing Zoll's Rectilinear Biphasic Waveform and testing its defibrillators generally.

For example, Mr. Packer testified about "clinical trials *that Zoll ran* that showed that our rectilinear biphasic waveform could actually defibrillate better than the standard monophasic waveform." A1953:3-9 (emphasis added). He further testified:

> [C]omparisons that exist that were done in clinical trials where you can see a difference between the Zoll waveform and other waveforms, including a biphasic truncated exponential. So we can use that in marketing so long as we're referencing those clinical trials. It is not a label that's been given us by the FDA.

A1969:13-24. A Zoll document listing "facts" about Zoll's waveform states that "Zoll's RBW has been tested with more than 2,800 patients in over a dozen human clinical studies." A14565-69 at A14569. Zoll presented no evidence showing this testing was not run by Zoll or that it was excluded under a safe-harbor statute. To the contrary, Zoll's witness admitted that Zoll performed "clinical testing" "on humans" on "products that are *already in the market*." A2484:4-21 (emphasis added). Thus, this testing was done after the products were on the market and was unrelated to FDA premarket approval.

Contrary to Zoll's arguments, Philips's expert testified that Zoll tested its defibrillators on humans. Zoll quoted part of Dr. Wolf's testimony, but failed to include another part:

> Q. There's no patient when the devices are tested, though, is there?
>
> A. Probably not. I mean, it depends on the testing that's being done. It would be done first on a resistor or something and then possibly on an animal and *then later on a patient.*

Compare A1687:20-24 (emphasis added) *with* Zoll Br. 24.

Additional evidence supports the jury's finding of direct infringement. For example, an internal Zoll memorandum states that "patient impedance measured during the first 100 µs of discharge was bigger than expected. Especially at [some] energy level with 126 Ohm patient impedance the measured impedance was

136–137 Ohm." A13304. Although the document used a resistor for the patient impedance, it nonetheless describes Zoll measuring a patient's impedance during the discharge and using that measured impedance to select a schedule. *Id.* In a series of emails on impedance measurement and defibrillator discharge, Mr. Lopin states that "the method *we now use* works well." A8936 (emphasis added). In a 2007 email to a doctor at the Mayo Clinic, Mr. Boucher wrote that "[w]e do, however, see many instances where the patient impedance was bouncing in and out of the 15-250 ohm range. . . . I suspect that the problem lies in trying to discharge when the patient's impedance was being measured at less than 15 ohms or greater than 250 ohms." A8474. Mr. Boucher further described the accuracy of the impedance measurement circuitry, implying the defibrillators have been used on people. A8483.

b. Zoll's Defibrillators Infringed the '212 Patent

Zoll contends that Philips failed to prove that Zoll directly infringed claims 1 and 5 of the '212 patent because "Zoll does not itself *use* defibrillators with electrodes in 'electrical communication' with a 'patient.'" Br. 25. As demonstrated above, Philips did prove that Zoll's defibrillators met this limitation.

The claim language that Zoll cites is merely functional language reflecting an intended use. Claims 1 and 5 are directed to "[a]n external defibrillator."

A451. The electrodes are part of the claimed defibrillator and are designed to be attached to a patient. The patient does not form part of a *defibrillator*.

This Court has interpreted functional language in an apparatus claim as requiring that the infringing product only possess the capability of performing the recited function. *Intel Corp. v. Int'l Trade Comm'n*, 946 F.2d 821, 832 (Fed. Cir. 1991). The limitation at issue is similarly functional language describing the product's capability. Zoll improperly reads method steps into an apparatus claim; the language in question merely establishes that "electrical communication with a patient" is the environment in which the claimed external defibrillator operates. *HTC Corp. v. IPCom GmbH & Co.*, 667 F.3d 1270, 1277 (Fed. Cir. 2012). Zoll's interpretation would also make a human being part of the claimed defibrillator. Claims should not be interpreted so as to make them nonsensical. *See Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1255 (Fed. Cir. 2010); *Schoenhaus v. Genesco, Inc.*, 440 F.3d 1354, 1357 (Fed. Cir. 2006).

Zoll does not dispute that it provides electrodes with its defibrillators, which are to be placed in electrical communication with the exterior of a patient. A7051-52; A1631:1-16; A1638:25-1639:5; A12428; A1644:13-18; A1648:2-6; A1650:15-19; A1652:25-1653:5; A1655:9-15; A1697:12-18.

D. Zoll's Challenge to Infringement of the Waveform Patents Based on Claim Construction Also Fails

For the "during the discharge" limitation of the '905 and '454 waveform patents, Zoll alleges errors in both the district court's claim construction and the jury's infringement verdict, but it fails to meet the burden for either. The district court's construction of "during the discharge" was consistent with and supported by the intrinsic record. Zoll's proposed construction, on the other hand, adds limitations to the claims that are not found in the specification. Philips also presented overwhelming evidence that Zoll's defibrillators monitored an electrical parameter "during the discharge" even under Zoll's proposed construction.

1. The District Court Correctly Construed "the Discharge Step" to Be "Discharging the Energy Source"

During claim construction, Zoll argued that "the discharge step" meant "the electrotherapeutic shock, not a test pulse to measure patient impedance." A5835. The district court rightly concluded that Zoll's "addition of that negative limitation to the claim term" was an attempt by Zoll to "resolve an infringement question during claim construction." A82. Zoll now appeals under a new construction, namely that the term means only "an electrotherapeutic shock." Br. 15. This is not the construction Zoll argued below, and Zoll cannot "introduce new claim construction arguments on appeal or alter the scope of the claim construction

positions it took below." *Digital-Vending Servs. Int'l, LLC v. Univ. of Phoenix, Inc.*, 672 F.3d 1270, 1273 (Fed. Cir. 2012) (citation omitted).

In any event, the district court's construction is supported by the intrinsic record. First, the claim language itself supports the construction. For example, claim 51 of the '454 patent sets out the method in three steps: (1) *charging* the energy source to an initial level; (2) *discharging the energy source across the electrodes* to deliver electrical energy to the patient; and (3) *monitoring* an electrical parameter *during the discharging step*. A376. Thus, the claim defines "the discharge step" as "discharging the energy source." Claim 2 of the '905 patent similarly requires that the energy source comprise a capacitor and the discharging step means "discharging the capacitor across the electrodes to deliver electrical energy to the patient in a waveform having more than one phase." A391.

Zoll argues that, because the claim preambles recite "method[s] of delivering electrotherapy," the discharge step must mean an "electrotherapeutic shock." Br. 15-16. But the preambles to do not require an "electrotherapeutic shock." They are directed to an overall method of applying electrotherapy, which is achieved through all of the claimed steps. Also, the claims include other steps, such as "charging the energy source" (A376), which shows that the preambles do not require delivering an electrotherapeutic shock in every step.

The specification also supports the district court's construction. The '454 patent describes the preferred embodiment as including "the steps of charging the energy source to an initial level; discharging the energy source across the electrodes to deliver electrical energy to the patient in a multiphasic waveform; [and] monitoring a patient-dependent electrical parameter during the discharging step." A371 at 3:45-50. Thus, the specification equates the "step" of "discharging the energy source" with "the discharging step."

Zoll mischaracterizes the prior-art references cited in the specification. For example, Zoll contends that the waveform patents "distinguish prior art methods that use 'test pulses' from their invention." Br. 16. The patents identify the Kerber reference as "describ[ing] an external defibrillator that administers a test pulse to the patient prior to administering the defibrillation shock." A371 at 3:9-15. Kerber uses a signal passed through the patient *during the charge cycle* to estimate patient impedance before discharge. A20354 n.5; A20364. The distinction lies not between types of pulses, but between charging and discharging.

The other prior art cited by Zoll describes a defibrillator that "measures the system impedance during delivery of [a first] shock and uses the measured impedance to alter the shape of a subsequently delivered shock." A371 at 3:5-8; Br. 17. It teaches using two complete shocks. It does not bear on the question here.

The preferred embodiment Zoll cites does not support its proposed construction. Br. 17-18. Figure 3 "is a flow chart showing the method steps following the decision . . . to apply an electrotherapeutic shock to the patient through electrodes attached to the patient and charging of the energy source." A390 at 5:1-6. The first step in Figure 3 is "initiate discharge in first polarity." A382. The device then checks whether the time elapsed and voltage delivered meet certain thresholds. *Id.* The only representation of "the discharge step" in Figure 3 is "initiate discharge in first polarity." *Id.* The "electrotherapeutic shock" in Figure 3 is not complete until the discharge in the second phase ends. *Id.*

Zoll also cites the prosecution history of the '905 patent, but omits a crucial portion of the quoted passage. Br. 18-19. Zoll omitted the portion of the response where the patentee explained how the Bell device operated:

> The energy dose is selected by the operator prior to delivery of the shock based on an estimated patient weight. Since it delivers a quantity of energy . . . .

A9186. The prosecution history highlights the distinction between an energy level selected manually in advance of the discharge step (Bell), and the waveform patents, which shape or adjust the waveform based on an electrical parameter monitored "during the discharging step." A391; A376.

2. Zoll's Defibrillators Infringed Even Under Its Modified Construction

Zoll does not dispute that its defibrillators infringed under the district court's construction. Instead, Zoll alleges that its defibrillators do not infringe if "the discharging step" is construed to mean "an electrotherapeutic shock." This noninfringement theory, however, fails in light of the evidence.

There is no dispute that Zoll's defibrillators measure a patient-dependent electrical parameter during the discharge of the energy source and that they contain a capacitor. A14584, ¶ 15; A2678:13-21; A1634:12-20; A14583, ¶ 12. The capacitor is charged before delivery of a shock. A14583, ¶ 12. Indeed, Zoll's defibrillators "will not respond to a user request for shock delivery until the capacitor is fully charged." *Id.* After a shock is requested and the capacitor is fully charged, "[c]urrent flow is initiated through the patient" (i.e., the defibrillator continuously discharges energy from the capacitor to the patient). A14583, ¶ 14. While energy is flowing from the capacitor to the patient, Zoll's defibrillators measure current anywhere from two to four times. A14584, ¶ 15. This occurs "[d]uring the first 100 to 250 μsec of current flow from the capacitor." *Id.* A resistor schedule is then selected based on those measurements, shaping the remainder of the discharge. A14584-85, ¶¶ 19-21. The current measurements (the electrical parameter in question) are taken during this continual discharge of the energy source. A14584, ¶ 15.

Zoll refers to the first 100-250 µsec of its defibrillator's discharge as a "sensing pulse" or "test pulse." Br. 19. The name applied to this portion of the discharge, however, does not alter the fact that this 100-250 µsec of current flow from the capacitor to the patient is part of the same discharge as the remaining waveform and the same electrotherapeutic shock. There is no pause or gap in the discharge between the first 250 µsec and the remainder of the first phase. A1753:18-1754:4. The "sensing pulse" or "test pulse" is not different or separate from the discharge of the energy source. A1753:2-6.

Moreover, a waveform or discharge cannot be broken out into a "therapeutic" and "non-therapeutic" portion. A1753:17-1754:10. No 250 µsec snippet of a waveform, whether at the beginning, middle, or end, will be therapeutic on its own. *Id.* Zoll's expert alleged that the first 250 µsec of the discharge was "non-therapeutic," and that the remainder of the discharge was part of the "therapeutic" shock. A2683:18-2684:24. But even he agreed that a 250 µsec snippet of what he viewed as the "therapeutic" shock would not defibrillate a patient. *Id.* Zoll's expert testified that a patient would need to receive the entire waveform, both first and second phase, to defibrillate with confidence. A2684:18-24; *see also* A1753:17-1754:10. Philips's expert never confirmed that the impedance measurements occur prior to the discharge or "electrotherapeutic shock," only that the measurements taken during what Zoll calls the "sensing

pulse" are used to select a schedule. A1733:1-1734:1. He repeatedly testified that the so-called "sensing pulse" is an integrated part of the waveform and part of a continuous discharge. A1760:12-1765:22.

Zoll's own internal documents rebut its noninfringement contention. For example, Zoll's website describes Zoll's waveform as follows: "[d]uring the first 250 µsec of a *shock delivery*, . . . the amount of current flowing through the patient is measured." A8432 (emphasis added); *see also* A2478:15-2479:1. Zoll's website also referred to the monitoring step as occurring "during . . . a shock delivery." A8432; *see also* A14566. A Zoll memorandum states that, "*[d]uring the discharge*, the accurate patient impedance is calculated and is not coupled to the calibrated impedance that was altered for this test." A8379-80 (emphasis added).

Zoll also repeatedly represented to the FDA that current measurements occur during discharge. For example, in response to a request from the FDA for a description of the first 250 µs of the biphasic waveform, Zoll stated that, "*[d]uring the first 100-250 µs of the Bi-Phasic waveform* the device is measuring voltage across and current through the patient and calculating the patient impedance." A12740 (emphasis added); *see also* A7974 (measuring impedance "at the beginning of defibrillator discharge"). Thus, Zoll infringed even under its modified construction.

E. The Verdict of No Invalidity of the Self-Test Patents Should Be Upheld

At trial, Zoll focused on its contention that claims 42, 67, and 68 of the ’374 patent were anticipated by the Wiley patent, the VivaLink brochure, and a defibrillator manual from a Japanese company called Nihon Kohden. But Philips antedated all three references by proving that claims 42, 67, and 68 are entitled to priority to the ’374 patent’s parent application. Despite devoting so much time at trial contesting priority and arguing that claims 42, 67, and 68 were anticipated, Zoll raises none of these issues on appeal. Instead, Zoll focuses on issues that took a backseat at trial—issues that Zoll largely ignored despite bearing the burden of proof.

1. The VivaLink Brochure Does Not Disclose a “Fail-Safe Visual Display” and Is Not Enabling

Despite only raising this issue in cursory fashion at trial, Zoll appeals the jury’s verdict that claim 43 of the ’374 patent is not invalid by alleging it is anticipated by the VivaLink brochure. Br. 30-33. But the VivaLink brochure does not disclose the claimed “fail-safe visual display.”

The ’374 patent describes what a “fail-safe visual display” is. A “system monitor” powers a shutter in the visual display to keep that shutter opaque. A6068 at 5:41-6:5. While the shutter is opaque, an OK symbol is displayed. *Id.* If the system monitor does not power the shutter, the shutter transitions to its transparent

state, which results in a display of the NOT OK symbol. *Id.* The '374 patent explains that a primary advantage of this design is "that [the display] is powered by an AC signal rather than a DC signal," which "ensures the display's fail-safe nature, since the shutter of middle plate 66 cannot be maintained opaque without the active involvement of the system monitor generating the AC signal." *Id.* at 5:66-6:5. That is, if the system monitor cannot provide power to the visual display (i.e., the system monitor does not work and fails to control the display), then the display will default to a NOT OK sign. This happens whether the system monitor fails at the outset or after passing a self-test. *Id.* at 5:35-6:5. And this is why the visual display in claim 43 is fail-safe—it defaults to a NOT OK symbol even if the component controlling it completely fails, regardless of whether it passed its self-tests.

Dr. Efimov described this concept to the jury, even providing a physical demonstration using Zoll's AED Pro. A1885:3-1886:25. With the batteries removed, the AED Pro displayed a red X. *Id.* When Dr. Efimov inserted the batteries—which provided the defibrillator with power—the status indicator changed to a green √. *Id.* This presentation demonstrated the critical feature of the fail-safe visual display—the ability of the AED Pro to show a red X even when the component controlling the display provides no power. The same result necessarily happens when the *defibrillator itself* has no power. *See* A1894:11-1895:3 (Dr.

Efimov explaining that Zoll's visual display is fail-safe because it defaults to a red X when the battery level is so depleted that the display cannot draw enough power to do anything). Zoll did not rebut Dr. Efimov's demonstration or testimony on the meaning of the fail-safe visual display term. And Zoll never proposed an alternative interpretation. Dr. Efimov's understanding of this term was confirmed by a Philips engineer who testified that "fail-safe" meant "even if the device is completely broken . . . or there's no power applied, the red X will still appear." A1325:18-25.

The VivaLink brochure is a four-page promotional pamphlet providing a high-level description of a defibrillator made by SurVivaLink Corp. A18679-82. This brochure was cited during prosecution of the '374 patent. A19266-67.[11] Zoll's expert, Dr. Halperin, confined his validity argument to one paragraph of the brochure. A18680; A2864:4-2865:13. He relied on the following two sentences to argue that the fail-safe visual display limitation was anticipated: "If any system is not within preset specifications, an audible and visual warning (Maintenance Alert)

[11] That the examiner considered the only reference Zoll relied on in its invalidity case against claim 43 makes the jury's finding of no invalidity more difficult to overcome. *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1304 (Fed. Cir. 2008) ("When no prior art other than that which was considered by the PTO examiner is relied on by the attacker, he has the added burden of overcoming the deference that is due to a qualified government agency presumed to have properly done its job[.]" (citation omitted)).

is triggered. Audible warnings will last until the batteries are exhausted but the visual signal will remain indefinitely." A18680; A2864:4-2865:13; Zoll Br. 31-32.

Neither these two sentences nor the brochure discloses the claimed fail-safe visual display. The brochure merely states that, if the defibrillator fails self-tests (i.e., "[i]f any system is not within preset specifications"), the status indicator will show a visual NOT OK warning, and that this visual warning will remain after the batteries die. A18680. The brochure does not disclose what happens if the defibrillator passed self-tests and the status indicator is displaying an OK symbol when the batteries die. Does the indicator switch to a NOT OK symbol or remain stuck in the OK mode? And if the indicator switches to a NOT OK symbol, how does this happen? These facts must be known before the display can be called fail-safe. A defibrillator that continues displaying an OK symbol after the batteries die is not fail-safe.

Zoll sidestepped these issues at trial. During direct examination, Dr. Halperin was asked whether he understood that "if all the power goes out in this VIVAlink device as described, the display will continue to show a warning *if the self-test failed*." A2865:8-13 (emphasis added). Dr. Halperin answered "yes," and the questioning stopped. *Id.* Dr. Halperin did not address what would happen if the VivaLink defibrillator passed self-tests and then the batteries died while the indicator was showing the OK message. If anything, the brochure indicates that

the OK message "will remain indefinitely" even after the device loses power. A18680. Thus, the VivaLink device exhibits the very problem solved by the patented fail-safe display. And Dr. Efimov confirmed that the VivaLink brochure "does not disclose fail-safe visual display." A5095:19-5096:7.[12]

The VivaLink brochure is also not enabling.[13] The brochure discloses nothing (i.e., no circuit schematic or detailed technical analysis) describing how to make or use a fail-safe visual display, either conceptually or physically. Dr. Efimov explained that the VivaLink brochure "is very, very short" and "does not teach how to make or use self-test." A5095:16-5096:7. Dr. Halperin never addressed the enablement issue. A2864:4-2865:13. He never even suggested that a person skilled in the art would know how to make or use the VivaLink brochure's visual display, let alone one with a fail-safe design. *Id.* Thus, even assuming that the burden to prove lack of enablement shifted to Philips, Philips met this burden, and Zoll provided no evidence in rebuttal. *Impax Labs., Inc. v. Aventis Pharm., Inc.*, 545 F.3d 1312, 1316 (Fed. Cir. 2008) (patentee overcame the

[12] While Zoll calls Dr. Efimov's testimony on the VivaLink brochure conclusory (Br. 32), Zoll fails to take into account all of his testimony on the fail-safe visual display, including his testimony on infringement where he explained the term. *See supra* 43-44. In contrast, Dr. Halperin devoted about a page of testimony to the fail-safe visual display and whether it was disclosed in the VivaLink reference. A2864:20-2865:25.

[13] The district court instructed the jury on enablement. A5330-31.

presumption of enablement by presenting evidence showing that prior art did not enable the claimed invention); *Bio-Technology Gen. Corp. v. Genentech, Inc.*, 267 F.3d 1325, 1329 (Fed. Cir. 2001) (restoring verdict of no enablement after stating that "[t]he evidence presented at trial must be considered in the light most favorable to the jury's verdict, drawing reasonable factual inferences and resolving issues of credibility in favor of the verdict").

2. Wiley Does Not Disclose Self-Tests on Two Different Periodic Schedules

Claim 7 of the '460 patent requires "a first automatic self-test on a first periodic schedule" and "a second automatic self-test on a second periodic schedule" (the "two periodic schedules" limitation). A406. Even though Zoll only discussed this issue briefly at trial, Zoll appeals the jury's validity verdict, arguing that Wiley anticipates claim 7. But Wiley does not disclose performing self-tests on two different periodic schedules; it only discloses performing self-tests on one schedule.

The self-tests in Wiley are performed serially beginning at a *single*, preselected time. A14938 at 20:20-21 (disclosing an "autotest routine" that "completes [an] extensive battery of tests"); A14931 at 6:3-10 ("The autotest routine 200 is initiated when the time on the real-time clock 113 equals a previously selected autotest start time stored in the . . . memory 105," such as 4:00 a.m.); *see also* A14932 at 7:14-31. Dr. Efimov explained that Wiley "does not

show at all the second periodic self-test on the second periodic schedule" because "[t]here's only one schedule 24 hours and multiple tests conducted on this one schedule." A5095:5-15.

The brief testimony Dr. Halperin provided on whether Wiley discloses two periodic schedules only confused the issue. A2859:4-22. Dr. Halperin mischaracterized an hourly CPU power-up function as a CPU self-test. A14931 at 6:11-20; A2858:19-2859:22. That is not how Wiley operates. Instead, a chain of extensive tests called an "autotest routine" (A14931-38 at 5:57-19:2) is triggered at a single, preset time in response to a real-time clock wakeup (A14931 at 6:3-10; A14932 at 7:14-31). The hourly CPU power-up function is a precursor to the autotest routine—the CPU checks to see if it can power up properly, then determines whether it is time for the daily autotest routine. A14931 at 6:21-30. This is similar to the limitation in claim 1 of the '460 patent (from which claim 7 depends), which requires "generating a test signal automatically" and then "turning on a power system within the external defibrillator in response to the test signal." A406. The two schedules of self-tests in claim 7 are not performed until after this power-up phase. *Id.* Unlike claim 7, however, Wiley only performs self-tests run on a single periodic schedule after the power-up function and, thus, cannot anticipate. A14931-38 at 5:57-19:2.

Even assuming the CPU wakeup function is a self-test, Wiley cannot anticipate because it would not perform the claimed steps in order. Claim 7 requires the system to power up before running the two sets of self-tests, but Wiley performs its CPU wakeup function, *then powers up*, and then runs its autotest routine. A14931 at 5:57-6:61, A14918 at Fig. 4A; *see also* A2852:16-2853:5. *See mFormation Techs., Inc. v. Research In Motion Ltd.*, 764 F.3d 1392, 1399-400 (Fed. Cir. 2014) ("logic" compelled finding that method steps in a particular claim must be performed in a specific order). Given this record, the jury was free to reject Dr. Halperin's interpretation of Wiley in favor of Dr. Efimov's and conclude that it does not anticipate. *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1365 (Fed. Cir. 2012) (explaining that "because of the procedural posture of this case" (i.e., the patentee won a jury verdict), the Court "must assume that the jury found" the patentee's experts credible, which meant that their testimony provided substantial evidence to support a conclusion that prior art failed to disclose claim limitations).

Zoll also accuses Dr. Efimov's testimony of being "terse." Br. 36. But Dr. Efimov's testimony on whether Wiley anticipated claim 7 was commensurate with the attention Zoll gave this issue at trial. Dr. Halperin only briefly addressed the issue (despite testifying for hours at trial) (A2859:4-25), and Zoll never raised it during opening or closing. In fact, during closing, Zoll argued that claim 7 was

anticipated, *but only in view of the VivaLink brochure*, which Zoll does not appeal. A5240:18-5241:3. Moreover, Wiley was cited during prosecution of the '460 patent (A9427), so Zoll had to overcome deference to the PTO. *PowerOasis*, 522 F.3d at 1304.

3. Claims 42, 67, and 68 of the '374 Patent Would Not Have Been Obvious

a. The Claimed Self-Test Feature Revolutionized the Defibrillator Industry

Claims 42, 67, and 68 of the '374 patent cover automatic, periodic self-tests performed without user intervention. While Zoll relies on prior art disclosing automated self-tests (e.g., power-on self-tests) (Br. 37-38), these prior-art self-tests *require the presence of a user*. Zoll identified no prior art disclosing an external defibrillator that ran automatic, periodic self-tests without user intervention and before power on.

During prosecution, the examiner rejected application claims over Eikefjord (U.S. Patent No. 5,097,830), which disclosed automated power-on self-tests. A19429-39. The examiner indicated that this rejection could be overcome by amending the claims "to set forth self test in the 'off' condition." A19440. A limitation was added requiring all self-tests to occur "prior to any attempted use of the defibrillator." A19441-46. In making this amendment, it was explained that

"[a]ll testing within the Eikefjord et al. device . . . occurs *during* use of the defibrillator" (i.e., after power-on). A19456-58.

At trial, Dr. Efimov reviewed the relevant prosecution history for the jury, explaining that power-on self-tests were known to the PTO and that the "patent examiner considered [power-on self-tests]" but found them "not sufficient to reject the patent." A5097:7-13; *see also* A1822:7-13. Notably, the district court construed the "prior to any attempted use of the defibrillator" term to mean "prior to an operator turning on the defibrillator." A84-85. Zoll does not now contest this construction.

In disclosing a self-test system that operates without user intervention, the '374 patent changed the defibrillator field. This invention put defibrillators in public places where maintenance was not as frequent—not just in hospitals and ambulances where maintenance was constant. A1817:16-23; A1828:4-1829:3; A1362:19-24; A1407:20-1410:2. Even Zoll's CEO, Mr. Packer, acknowledged the importance of the automatic, periodic self-test feature when testifying that this feature allowed Zoll to enter the public-access defibrillator market. A1943:11-21; *see also* A1936:18-1937:11; A1939:17-23. Philips's CEO concurred, testifying that Heartstream's self-test features were "very important" in building a new market for automatic external defibrillators—a market that included schools, churches, airports, and homes. A2021:23-2022:17; *see also* A2022:18-2033:3.

For obviousness, Zoll relies on a prior-art defibrillator that performs traditional self-tests after power-on, just like the self-tests considered and overcome during prosecution. Br. 37. Zoll then relies on "computerized automation" to argue that the invention would have been obvious. Br. 38-40. But Zoll itself argues that prior art after-power-on self-tests were already automatic (Br. 37), so simply saying that automating self-tests would have been obvious is inconsequential.

And, contrary to Zoll's assertions (Br. 40), arriving at the automatic, periodic self-test feature was not simply a matter of combining a timing component (e.g., a real-time clock) with a power-on self-test (e.g., Zoll's PD1400 manual or the First Medic 610 manual).[14] As Dr. Efimov explained, defibrillators are "very, very complex piece[s] of technology" with "so many vital features" that "must work when you are attempting to save human life." A1839:1-5. Ensuring that all vital defibrillator features are working properly becomes difficult in public environments because of power concerns. Different periodic self-tests consume various amounts of power, and a proper balance must be struck between "run[ning]

[14] Zoll could not prove that the Real Time Clock Handbook it relied on predated the priority date for claims 42, 67, and 68. A17712-14. Thus, Zoll was left to rely on general testimony on the existence of real-time clocks in unrelated fields. *See, e.g.*, A2844:22-2845:22 (Halperin testifying generally about real-time clocks).

all those [self] tests all the time" to "make sure everything works properly," on the one hand, and "deplet[ing] the battery very, very quickly," on the other. A1827:4-25; A1838:25-1840:5. The complexity of striking this balance is shown in Figure 6 of the '374 patent. A426. Dr. Halperin glossed over these power-consumption issues, and the jury was free to reject his testimony. *See, e.g.*, A2886:8-20. The evidence shows that an automatic, periodic self-test before power-on presents design challenges that could not be solved merely by integrating timing components into power-on self-tests—much more was required.[15] *See, e.g.*, A1827:4-25; A1839:6-1840:5; A1883:5-1884:19.

As Zoll's CEO admitted, automatic self-testing after power-on was a "well-known concept" that existed "in the '80s" (A1940:16-24), as were timing components (A2844:22-2845:22 (Dr. Halperin testifying that he used real-time clocks in the 1980s)). Yet Zoll identified no prior art disclosing an external

[15] This conclusion is reinforced by Eikefjord (U.S. Patent No. 5,097,830), which the PTO applied during prosecution. It *discloses a real-time clock* in the same paragraph as its power-on self-test. Yet Eikefjord mentions nothing about automatic, periodic self-tests before power-on. Zoll declined to introduce Eikefjord as prior art at trial, opting instead to rely on the PD1400 and the First Medic 610 for power-on self-test disclosures. But because Eikefjord is a public document discussed extensively in the prosecution history exhibit provided to the jury (A19437-38; A19456-58), this Court is free to take judicial notice of Eikefjord and rely on it for its analysis. *See Hoganas AB v. Dresser Indus., Inc.*, 9 F.3d 948, 954 n.27 (Fed. Cir. 1993) (taking judicial notice of patent because it was "publicly accessible" and "was referred to at the argument").

defibrillator capable of running self-tests before power-on and without user intervention.[16] *See Leo Pharm. Prods., Ltd. v. Rea*, 726 F.3d 1346, 1356-57 (Fed. Cir. 2013) (The "elapsed time between the prior art and the [patent's] filing date" is relevant in the obviousness analysis).

And it was not for a lack of trying. The stakes were high in the defibrillator field, where seconds can mean life and death. Companies were chasing the goal of a public-access defibrillator, which was evident in statements made by Heartstream during a trade secret litigation, characterized by Zoll as "prior admissions." Zoll Br. 39. But Heartstream's statements were not admissions that the automatic, periodic self-test before-power-on feature was in the prior art; at most, they show that Heartstream knew other companies were working on designing an external defibrillator with this feature while it was doing so. A17304. For instance, Heartstream referenced documents relating to the Wiley and VivaLink defibrillators (*id.*), but Philips proved at trial that claims 42, 67, and 68 predate these disclosures.[17] At the end of the day, Heartstream was first to invent.

[16] Zoll tried to show that Nihon Kohden, a Japanese defibrillator company, designed a prior-art defibrillator with automatic, periodic self-tests. But Zoll was unsuccessful and did not appeal that issue.

[17] Zoll's reference to Imran (Br. 39) is misplaced. Imran concerns an *implantable* defibrillator, was overcome during prosecution (A19422-24), and was not asserted at trial.

b. Secondary Indicia of Nonobviousness Support the Jury's Verdict

In challenging Philips's reliance on secondary considerations and arguing against nexus, Zoll ignores the evidence. For instance, Dr. Efimov testified that the automatic, periodic self-test feature solved a long-felt but unmet need. He explained how past defibrillators had "only been used by professionals in the hospital settings," and that in these circumstances, "you can afford to have technicians/biomedical engineers who will essentially attend to the defibrillator." A1828:1-1829:3. According to Dr. Efimov, "there was an unmet need in the beginning of the 1990s" for a defibrillator "which can be deployed [in] public places." *Id.* Dr. Efimov testified that the automatic, periodic self-test met this need because it allowed for "widespread dissemination" of defibrillators, "and now you can clearly see [them] everywhere in public places." *Id.*; *see also* A5101:6-5102:15.

Dr. Freese confirmed Dr. Efimov's testimony, stating that "[i]n the 1990s," the survival rate for cardiac arrest in New York City was "dismally low" and that "having a device that indicated its readiness in advance of its need became a very important component of the AEDs that were used" because "you're losing 7 to 10 percent of your survival chance for every minute." A1371:20-1372:12; A1407:20-1408:14. Even Zoll's CEO acknowledged that it was the self-test before-power-on

feature that enabled Zoll to enter the public-access defibrillator market. A1943:11-21; *see also* A1936:18-1937:11; A1939:17-23.

That the automatic, periodic self-test feature helped solve a long-felt need was confirmed commercially when Heartstream (and then Philips) added this feature to its product line. A14483-85; A1830:7-1832:12; A5102:7-15. Philips's R&D Director described this feature as a "pillar[]" of Philips's defibrillators and "key" to their reliability. A1347:4-9; A1352:6-20. Philips's CEO testified that Heartstream's innovative self-test features were "very important" in building a new public-access market for automatic external defibrillators. A2021:23-2033:3.

When it first introduced the ForeRunner defibrillator (which ran automatic, periodic self-tests before power on), Heartstream faced resistance. A2022:18-2024:5. People feared putting defibrillators into the hands of the untrained public. But Heartstream eventually broke through when airlines began installing ForeRunners on planes, in part because of the automatic, periodic self-test feature. A2022:18-2024:23; A2026:15-2027:16.

Continuing where Heartstream left off, Philips developed the HeartStart Home defibrillator, which like the ForeRunner, ran automatic, periodic self-tests without user intervention. A1351:13-1352:20; A1486:19-24. In 2004, the HeartStart Home became the first defibrillator to obtain "over-the-counter" clearance from the FDA. A2030:24-2033:3. At the time of trial (nearly ten years

later), the Heartstart Home remained the only defibrillator available for purchase over the counter. *Id.* Putting defibrillators into homes was a significant achievement because that is where over 70% of cardiac arrests occur. *Id.*

Philips's defibrillators achieved significant commercial success. In part because of its patented self-test features, Philips's market share in the AED industry grew to "the number one position both in the United States and worldwide." A1354:20-1355:6. Philips sold over 100,000 AEDs per year from 2009-2013 and has shipped over one million AEDs. A1355:13-18.

Philips's R&D Director testified that the automatic, periodic self-test feature is one that customers demanded. A1352:6-1355:6. Philips's CEO agreed, stating that "self-test was one of the big reasons why people bought defibrillators." A2037:21-23. And Dr. Freese testified that the automatic, periodic self-test feature "is something that [he] as a medical director would insist on being in a device that was purchased." A1409:8-1410:2.

Philips's AEDs have achieved industry acclaim because of the periodic, automatic self-test feature. A12714-15 (Forbes article praising daily self-test feature); A5103:5-9. And other companies copied this feature. *See, e.g.*, A2035:20-2036:9 (Philips CEO testifying that Cardiac Science used Heartstream's self-test technology); A2037:21-2038:4; A1943:11-21; A1965:22-1966:8.

That the periodic self-test feature in the '374 patent satisfied a long-felt need, was widely accepted, was in demand, achieved commercial success, earned industry praise, and was copied is strong evidence of nonobviousness. *See, e.g.*, *Kinetic Concepts*, 688 F.3d at 1367-71. The jury had a legally sufficient basis to conclude that claims 42, 67, and 68 of the '374 patent were not obvious, and the verdict should be upheld.[18] *See Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 711 F.3d 1348, 1369 (Fed. Cir. 2013) (district court correctly upheld nonobviousness verdict because "[o]bjective evidence of secondary considerations is a factual dispute underlying obviousness," and "[w]e are thus bound to assume that the jury resolved the evidence of secondary considerations in favor of [the patentee]").

F. The Jury's Verdict on Validity of the '905 Claims Should Be Upheld

At trial, Zoll offered only a single invalidity theory for claims 4 and 8 of the '905 patent, namely that they were anticipated by the Kroll '686 patent. The jury's verdict rejecting this lone validity challenge is supported.

As Philips's expert testified, Kroll does not disclose "shaping the waveform so that an initial parameter of a waveform phase depends on a value of the

[18] In arguing that no nexus exists, Zoll applies too strict a standard. Br. 41-43. "[E]vidence of nonobviousness need only be 'reasonably commensurate with the scope of the claims.'" *See Rambus Inc. v. Rea*, 731 F.3d 1248, 1257 (Fed. Cir. 2013) (citations omitted).

electrical parameter." A5046:12-18. This is not a "phantom limitation" (Zoll Br. 48), but rather a necessary claim element. Kroll discloses using an entirely preset waveform. The voltage across the capacitor is monitored until it reaches 44 percent of its initial value. A5042:7-19. At that point, the device stops monitoring voltage and automatically adds 1.6 milliseconds to the end of the discharge. *Id.* Kroll uses a preset voltage and a preset amount of time. A5042:20-5043:1. Dr. Kroll agreed with this characterization, testifying that the patent discloses using "a preset amount of energy and a fixed period of time." A2713:1-5.

Thus, Kroll did not adjust the waveform based on the value of the monitored patient-dependent electrical parameter, but rather based solely on preset values. If all of the parameters in the first phase are preset, the device is not shaping the waveform based on measurements taken during the discharge after the parameters have been set. A5047:4-9; A5044:20-24. To the extent any adjustments are made, they are done based on preset parameters, not patient-dependent electrical parameters monitored during the discharge. A5047:10-25; A388 at 1:61-2:2.

Zoll argues the "first phase ending voltage" shapes the waveform. Br. 47. Under this theory, the final voltage of the first phase effects the initial voltage of the second phase. Br. 45-47. But Kroll does not teach adjusting or shaping the final voltage of the first phase based on a monitored electrical parameter. Once the predetermined value is reached, time is the only parameter measured and the only

parameter that adjusts or shapes that waveform, if at all. A5049:12-5050:4. To the extent there are any differences in the second phase, those differences are not due to the monitored parameter, but due to time. *Id.* Time is not a patient-dependent electrical parameter. A5050:5-6.

For claim 8, Zoll's expert discussed the wrong "parameter." In claim 8, the discharge parameter (or "initial parameter") is current. This is a different "parameter" than the "monitored patient-dependent electrical parameter." But when asked what met the limitation of claim 8, where the adjusted initial parameter is current, Dr. Kroll testified that "*monitoring* voltage is basically getting the identical result of *monitoring* current." A2649:14-22 (emphases added). Thus, Dr. Kroll testified on the "monitor[ed]" parameter, but he never addressed the separate "initial parameter" limitation of claim 8. There was simply no evidence that this limitation was disclosed.

Finally, Zoll relies on an interrogatory response in a trade secret case to support its anticipation argument. Br. 48. But Zoll's expert admitted that the interrogatory document was not prior art and that he was not relying on it to say that the asserted claims were anticipated. A2715:14-2716:1. The document was prepared by attorneys in a case involving trade secrets, not patents. A2716:20-22. Zoll's expert tried to say that he relied on the document for obviousness, but simultaneously admitted that he was not offering an opinion on obviousness.

A2714:17-22; A2715:18-21. Thus, legally sufficient evidence supports the jury's verdict that claims 4 and 8 of the '905 patent are valid.

III. CONCLUSION

This Court should reverse the district court's denial of judgment as a matter of law on Zoll's contributory infringement and direct the district court to enter judgment of contributory infringement. This Court should also reverse the district court's denial of judgment as a matter of law on the invalidity of the '526 patent and direct the court to enter judgment of invalidity. Alternatively, the Court should order a new trial on validity of the '526 patent. This Court should also deny Zoll's request to overturn the verdicts of direct infringement and no invalidity of the waveform and self-test patents.

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Respectfully submitted,

/s/ J. Michael Jakes

J. Michael Jakes
Kathleen A. Daley
Robert F. Shaffer
Luke J. McCammon
Jason L. Romrell
FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP
901 New York Avenue, NW
Washington, DC 20001-4413
(202) 408-4000

Attorneys for Plaintiffs-Appellants
Koninklijke Philips N.V. and Philips
Electronics North America Corporation

CERTIFICATE OF SERVICE

I certify that on April 9, 2015, this Reply and Cross-Appeal Response Brief of Plaintiffs-Appellants Koninklijke Philips N.V. and Philips Electronics North America Corporation was filed electronically using the CM/ECF system and served via the CM/ECF system on counsel for Defendant-Cross Appellant as follows:

David I Ginder
Irell & Manella LLP
1800 Avenue of the Stars, Suite 900
Los Angeles, CA 90067-4276

/s/ J. Michael Jakes

CERTIFICATE OF COMPLIANCE

I certify that this Reply and Cross-Appeal Response Brief of Plaintiffs-Appellants Koninklijke Philips N.V. and Philips Electronics North America Corporation contains 13,973 words as measured by the word processing software used to prepare this brief.

/s/ J. Michael Jakes