Consolidated Appeal Nos. 2020-2222, 2021-1527

In the

United States Court of Appeals

for the

Federal Circuit

THE CALIFORNIA INSTITUTE OF TECHNOLOGY,
Plaintiff-Appellee

v.

BROADCOM LIMITED, nka Broadcom Inc., BROADCOM CORPORATION,
AVAGO TECHNOLOGIES LIMITED,
nka Avago Technologies International Sales Pte. Limited, APPLE INC.,
Defendants-Appellants

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*Appeal from the United States District Court for the Central District of California,
in Case No. 2:16-CV-03714-GW-AGR · Honorable George H. Wu, Judge*

NON-CONFIDENTIAL BRIEF OF APPELLEE (CORRECTED)

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FEDERAL CIRCUIT RULE 28(A)(12)(B) STATEMENT

Claims 20 and 22 of the '710 patent

15. A coder comprising:

a first coder having an input configured to receive a stream of bits, said first coder operative to repeat said stream of bits irregularly and scramble the repeated bits; and

a second coder operative to further encode bits output from the first coder at a rate within 10% of one.

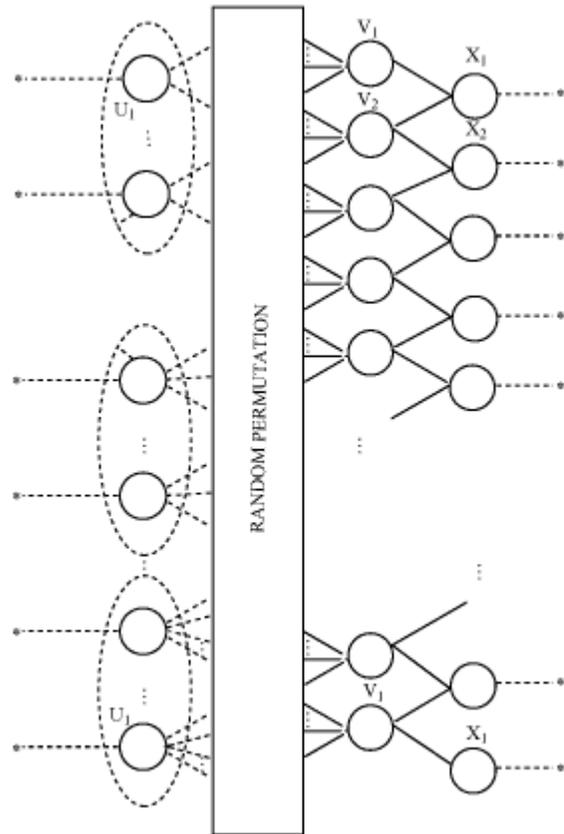20. The coder of claim 15, wherein the first coder comprises a low density generator matrix coder.

21. The coder of claim 15, wherein the second coder comprises a rate 1 linear encoder.

22. The coder of claim 21, wherein the second coder comprises an accumulator.
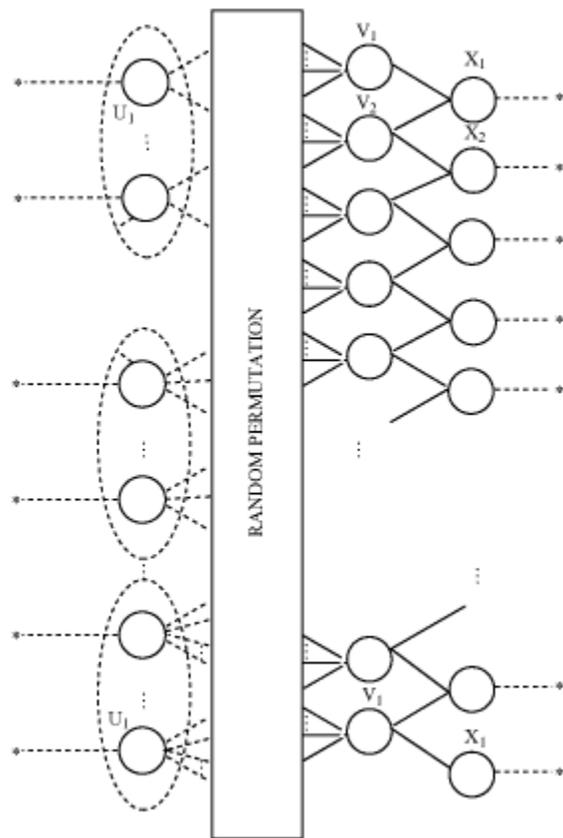
Claims 11 and 18 of the '032 patent

11. A device comprising:

an encoder configured to receive a collection of message bits and encode the message bits to generate a collection of parity bits in accordance with the following Tanner graph:

18. A device comprising:

a message passing decoder configured to decode a received data stream that includes a collection of parity bits, the message passing decoder comprising two or more check/variable nodes operating in parallel to receive messages from neighboring check/variable nodes and send updated messages to the neighboring variable/check nodes, wherein the message passing decoder is configured to decode the received data stream that has been encoded in accordance with the following Tanner graph:

Claim 13 of the '781 patent

13. A method of encoding a signal, comprising:

receiving a block of data in the signal to be encoded, the block of data including information bits; and

performing an encoding operation using the information bits as an input, the encoding operation including an accumulation of mod-2 or exclusive-OR sums of bits in subsets of the information bits, the encoding operation generating at least a portion of a codeword,

wherein the information bits appear in a variable number of subsets.

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[1]   Claims 11 and 18 of the '032 patent were the subject of a certificate of correction that modified certain text in these Tanner graphs. Appx279.

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

The California Institute v. Broadcom Limited

Consolidated Appeal Nos. 2020-2222, 2021-1527

<u>CERTIFICATE OF INTEREST</u>

Counsel for The California Institute of Technology certifies as follows:

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

The California Institute of Technology

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

N/A

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

N/A

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

Quinn Emanuel Urquhart & Sullivan, LLP**,** Deepa Acharya, Heather Elizabeth Belville, Ron Hagiz, Seung Woo Hur, Jordan R. Jaffe, Kevin A. Smith, Victoria F. Maroulis, Rachael L. McCracken, William C. Price, Valerie Roddy, Margaret Hsiao-Shia Shyr, Charles McLean Stiernberg, Jr., Lance L. Yang, Zhaoxin Yin, Ognjen Zivojnovic

5. Other than the originating case number(s), the title and number of any case known to counsel to be pending in this or any other court or agency that will directly affect or be directly affected by this court's decision in the pending appeal are:

None

6. Provide any information required under Fed. R. App. P. 26.1(b) (organizational victims in criminal cases) and 26.1(c) (bankruptcy case debtors and trustees). Fed. Cir. R. 47.4(a)(6).

N/A

DATED: March 19, 2021

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CONFIDENTIAL MATERIAL OMITTED

The material omitted from brief pages 12, 15, 42, 43, 49-53, 58-60 contains provisions from various contracts, including royalty rate, pricing, and other terms from settlement and license agreements with third parties, and details of the relationship between Apple and Broadcom.

TABLE OF AUTHORITIES

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STATEMENT OF RELATED CASES

No appeal from this civil action was previously before this or any other appellate court.

The Court's decision in this appeal may directly affect the following pending cases, in which Appellee has asserted the '710, '032, and/or '781 patents: *California Inst. of Tech. v. HP Inc.*, No. 6:20-cv-01041 (W.D. Tex.), and *California Inst. of Tech. v. Dell Techs. Inc.*, No. 6:20-cv-01042 (W.D. Tex.). Counsel for Caltech are unaware of any other case pending in this Court or any other court that will directly affect or be directly affected by the Court's decision in the pending appeal.

INTRODUCTION

This appeal arises from a patent infringement judgment of the District Court for the Central District of California (Wu, J.) after a two-week jury trial and a series of detailed and meticulous pre- and post-trial rulings. The jury found that Defendants-Appellants Broadcom Limited, Broadcom Corporation and Avago Technologies Limited (collectively, "Broadcom") and Apple Inc. ("Apple," and collectively with Broadcom, "Defendants") infringed all five asserted claims of three patents owned by Plaintiff-Appellee California Institute of Technology ("Caltech"). The court denied (Appx194-240) post-trial motions to overturn the jury verdict (Appx190-193) and awarded $270,241,171 in damages plus $18,004,985 in prejudgment interest against Broadcom and $837,801,178 in damages plus $47,640,650 in prejudgment interest against Apple, plus ongoing royalties and post-judgment interest (Appx253-254), and costs (Dkt. 2277).

This Court should affirm. The district court correctly rejected (Appx197) the "kitchen sink" of arguments Defendants made post-trial, and this Court should likewise reject the plethora of issues they raise on appeal. Many of Defendants' arguments are fatally waived. To the extent not waived, their arguments largely seek to second-guess the fact-finding prerogatives of the jury and the discretion of the trial judge. And Defendants' legal arguments lack merit.

This Court should also reject Defendants' attempts to diminish the value of the patents-in-suit, which concern the technology for error correction coding for the transmission of data. The patents arose from groundbreaking research by Caltech scientists who pioneered new technology that today permits transmission of data more accurately over Wi-Fi and other channels. These improvements allow for faster speeds, increased range, reduced computational load, reduced chip temperature, reduced power consumption, extended battery life, reduced chip size, and improved reliability. The relevant claim constructions were proper and the jury's infringement findings were well-grounded in the evidence. The liability judgment should be affirmed.

This Court should likewise affirm on damages. Caltech's expert damages testimony used standard hypothetical-negotiation methodology, and Defendants chose to present no expert damages testimony whatsoever. While Defendants protest the finding of separate royalty rates for each defendant, Caltech's unrebutted damages testimony properly considered the value of the inventions to each defendant, the real-world patent license most comparable to each defendant's situation, and the nature of each defendant's infringement. No infringing product was subject to more than one royalty. And while Defendants protest the size of the judgment, it is a simple consequence of the scale of Apple's and Broadcom's infringing conduct: In the relevant time period, Apple sold nearly 600 million

infringing devices and Broadcom imported or sold over a billion additional infringing Wi-Fi chips.

COUNTERSTATEMENT OF THE ISSUES

1. Whether the judgment of infringement is supported by (a) proper construction of the "repeat" limitation, (b) substantial evidence that the accused products meet the "irregularly repeat" limitation, and (c) substantial evidence that the accused products meet the "sum of bits" limitation.

2. Whether claim 13 of the '781 patent is directed to patent-eligible subject matter.

3. Whether the district court properly (a) precluded prior-art invalidity defenses based on *inter partes* review ("IPR") proceedings, (b) granted summary judgment of no inequitable conduct, and (c) limited the use of prior-art evidence at trial.

4. Whether the damages judgment properly rests on (a) separate running-royalty rates for each defendant, (b) admissible expert damages testimony, (c) the proper exclusion of Defendants' damages testimony, (d) entirely U.S.-based sales, and (e) grounds that independently suffice for affirmance even if liability were partially reversed.

COUNTERSTATEMENT OF THE CASE

A.   Caltech And Its Inventions

Caltech is one of the world's leading research universities, particularly in the areas of science and technology. Appx2330. Founded in 1891 and located in Pasadena, it boasts approximately 2,000 students and 200 faculty members. Appx2330. Caltech is where Albert Einstein taught when he came to the United States, the DNA sequencer was invented, the Richter scale was developed, and the quantum computer was conceived. Appx2331-2332. Its research is funded, in part, from patent licensing royalties generated by its Office of Technology Transfer. Appx2335-2336.

Caltech is the owner of U.S. Patents Nos. 7,116,710 ("the '710 patent"), 7,421,032 ("the '032 patent"), and 7,916,781 ("the '781 patent"). The patents name as inventors Professor Bob McEliece, who retired in 2009 and passed away in 2019, and two of his graduate students, Drs. Hui Jin and Aamod Khandekar. Appx2339; Appx2371-2373. Drs. McEliece, Jin, and Khandekar worked in the field of error correction, which involves techniques to correct errors that occur in data (especially wireless) transmissions due to noise or interference. Appx2346-2348. A simple example of adding error correction to a message is to repeat the message three times so that errors can be detected by the recipient (when the three copies are not identical) and the error corrected by a majority vote. Appx2348.

Caltech's patents describe more sophisticated error correction inventions. The patents use a novel combination of irregular repetition and accumulation to achieve faster and more reliable data transmissions. Information bits to be transmitted are passed through an error correction encoder. Appx2708. The encoder outputs codewords that are comprised of the original information bits along with parity bits. Appx2708-2709. The patents describe generating codewords and parity bits by repeating the information bits a variable number of times (*i.e.*, "irregularly"), scrambling the information bits, summing subsets of information bits, and accumulating the information bits to generate parity bits, which serve as a check on the transmitted information bits. Appx2711-2714. The codewords are then transmitted to a receiving device. Because noise or interference may introduce errors into the codewords during transmission, the receiving device uses a decoder to correct the received codeword using the parity bits and outputs the information bits in their original form. Appx2709.

The inventions provide significant advantages for Wi-Fi. By improving error correction, the patents allows for faster speeds, increased range, reduced computational load, reduced chip temperature, reduced power consumption, extended battery life, reduced chip size, and improved reliability. Appx2634-2641. Internal Apple and Broadcom documents, for example, confirmed that the patented technology allowed for substantially increased signal strength, range and speed,

and stated that adding the technology to Defendants' chips was a "good opportunity to jam the competition." App2673-2695.

There are five patent claims at issue in this appeal. Claims 20 and 22 of the '710 patent are dependent apparatus claims that relate to the coders that generate the codeword. They recite:

> 15. A coder comprising:
>
> a first coder having an input configured to receive a stream of bits, said first coder operative to repeat said stream of bits irregularly and scramble the repeated bits; and
>
> a second coder operative to further encode bits output from the first coder at a rate within 10% of one.
>
> 20. The coder of claim 15, wherein the first coder comprises a low-density generator matrix coder.
>
> 21. The coder of claim 15, wherein the second coder comprises a rate 1 linear encoder.
>
> 22. The coder of claim 21, wherein the second coder comprises an accumulator.

Appx265.

Claims 11 and 18 of the '032 patent are apparatus claims that recite an encoder and a decoder that operate in accordance with a Tanner graph, which is a visual representation of error correction codes that specifies the relationship between information bits and parity bits. Appx2711. They recite:

> 11. A device comprising:

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an encoder configured to receive a collection of message bits and encode the message bits to generate a collection of parity bits in accordance with the following Tanner graph:

18. A device comprising:

a message passing decoder configured to decode a received data stream that includes a collection of parity bits, the message passing decoder comprising two or more check/variable nodes operating in parallel to receive messages from neighboring check/variable nodes and send updated messages to the neighboring variable/check nodes, wherein the message passing decoder is configured to decode the received data stream that has been encoded in accordance with the following Tanner graph:

Appx277-278.

Claim 13 of the '781 patent is a method claim that relates to the process of generating codewords. It recites:

13. A method of encoding a signal, comprising:

receiving a block of data in the signal to be encoded, the block of data including information bits; and

performing an encoding operation using the information bits as an input, the encoding operation including an accumulation of mod-2 or exclusive-OR sums of bits in subsets of the information bits, the encoding operation generating at least a portion of a codeword,

wherein the information bits appear in a variable number of subsets.

Appx291.

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B.   The Accused Products

Caltech filed suit against Apple and Broadcom alleging infringement by certain Broadcom Wi-Fi chips and Apple products incorporating those chips. The accused Broadcom chips were developed and supplied to Apple pursuant to Master Development and Supply Agreements ("MDSA") negotiated and entered into in the United States. Appx3279-3280. The design of the chips resulted from multi-year work between Broadcom and Apple in the United States. Appx3287-3290; Appx10470; Appx10475-10479. Apple specifically required that Broadcom include the infringing feature in the infringing chips. Appx2680-2685; Appx3304-3309.

As detailed at trial, the infringing chips receive information bits that are first processed by a low-density generator matrix ("LDGM") coder. Appx2720. The LDGM coder receives a set of information bits and performs irregular repetition, scrambling, and summation operations. Appx2720-2723. The sums of information bits are accumulated to form parity bits by the "accumulator." Appx2738; Appx2752; Appx2765. The accused encoders output the parity bits with the original information bits to form codewords. Appx2827-2829; Appx2976. Those codewords are transmitted wirelessly to the receiving device, where they are decoded to correct errors introduced during transmission. Appx2976-2977; Appx3638.

C.   The District Court Proceedings

Prior to trial, the court construed the patent claims, resolved various evidentiary disputes and ruled on summary judgment motions. Because the PTAB had rejected Defendants' ten IPR petitions, *see Apple Inc. v. Cal. Inst. of Tech.*, 796 F. App'x 743 (Fed. Cir. 2020) (affirming PTAB), the court granted summary judgment precluding Defendants' prior-art defenses pursuant to 35 U.S.C. § 315(e)(2). Appx36-63. The court also denied Defendants' motion for summary judgment under 35 U.S.C. § 101, ruling that claim 13 of the '781 patent satisfied step one of the patent-eligibility test articulated in *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208 (2014). Appx64-100. And the court granted summary judgment on Defendants' inequitable-conduct defenses, finding their arguments waived or unsupported by substantial evidence of materiality. Appx101-112. The court excluded portions of Defendants' damages expert opinions as unreliable, denied motions to exclude Caltech's damages expert testimony, and excluded as unduly prejudicial certain prior-art references that had been the subject of Defendants' precluded obviousness defenses. Appx1-35; Appx138-169.

The case proceeded to a two-week trial during which the jury heard evidence of over one-and-a-half billion infringing sales or importations. Apple imported and sold nearly 600 million infringing devices in the United States, and Broadcom imported 51 million infringing chips into the United States and additionally sold

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nearly a billion infringing chips to Apple in the United States that were incorporated into Apple devices later sold overseas. Appx3313-3314; Appx3330-3332. Defendants did not call their damages expert at trial, but the jury heard that this same expert had opined in a previous case that a reasonable royalty for the patents was **[number]** per unit. Appx3475. The jury found infringement of all asserted claims and awarded $270,241,171 against Broadcom and $837,801,178 against Apple. Appx190-193.

After trial, the court denied Defendants' motions for judgment as a matter of law or a new trial, awarded interest, denied a request for a permanent injunction, awarded an ongoing royalty, and entered final judgment. Appx194-254.

SUMMARY OF ARGUMENT

I. The infringement judgment should be affirmed.

First, the district correctly declined to construe the "repeat" limitation of the '710 and '032 patents to exclude "reusing bits" and require generating new, distinct information bits. Nothing in the plain claim language or intrinsic evidence requires that construction, and it would exclude two preferred embodiments.

Second, substantial evidence supports infringement of the "irregular repetition" limitations. The evidence showed that the infringing products "reused" information bits and did so a different number of times (i.e., "irregularly"). And even if Defendants' erroneous construction of "repeat" were adopted, the evidence

showed that the infringing products duplicated information bits and did so irregularly. To the extent the limitation was not literally infringed, substantial evidence supports a judgment of infringement by equivalents. Nor did the court err in declining Defendants' request to instruct the jury that the '781 patent's "variable number of subsets" limitation requires "irregular repetition of information bits."

Third, substantial evidence supports a finding that the infringing products add together two or more information bits, as required by the '781 patent's "sums of bits" limitation. Defendants' own expert swore under oath that their products "sum information bits." Moreover, Defendants do not dispute that the products add together the output of certain logic gates or multiplexers, and the evidence refutes Defendants' argument that these outputs are not information bits.

II. Claim 13 of the '781 patent is directed to patent-eligible subject matter and not an abstract mathematical idea. As the district court correctly concluded, the claim is directed to a non-abstract method for encoding data that improves on prior data encoding methods for more efficient data transmission.

III. The district court's IPR-related rulings should be affirmed.

First, the court correctly interpreted section 315(e)(2) as estopping invalidity-based defenses Defendants "*reasonably could have raised* during that

inter partes review." Defendants filed ten IPR petitions, knew about the relevant prior art they raise now, and did not include it in the petitions.

Second, the court correctly rejected inequitable conduct. Defendants do not challenge the district court's finding of waiver as to some materiality arguments, and they waived other materiality arguments by presenting them for the first time on appeal. Defendants' materiality arguments also fail on the merits.

Third, the district court was within its discretion in allowing Defendants to use properly disclosed prior art at trial to show the state of the art and damages while excluding the use of prior-art references for "practicing the prior art" and "independent development" defenses.

IV. The damages judgment should be affirmed. Defendants introduced no expert damages testimony at trial, leaving Caltech's damages case unrebutted.

First, the finding of separate royalty rates for each defendant is legally proper and supported by substantial evidence. It is no surprise that hypothetical negotiations with each defendant would result in different royalty rates based on the different nature of their infringement and the different value that each derived from the inventions. No infringing product was subject to two royalties, and each defendant was held accountable for only its own infringement and no more.

Second, Caltech's expert damages testimony employed well-accepted hypothetical-negotiation methodology and relied on comparable patent licenses.

Third, the district court was within its discretion in excluding portions of Defendants' expert damages testimony and Defendants' cursory challenges here should be rejected.

Fourth, substantial evidence supports the judgment that all sales included in the royalty base occurred within the United States. Broadcom and Apple worked jointly in the United States to [contract provision] the infringing products, negotiated their MDSAs in the United States, and negotiated and agreed to production commitments and price terms in the United States.

Finally, even if the Court reversed liability in part, it should not remand for a new damages trial. The district court properly held, applying regional circuit law, that Defendants waived any such remedy by failing to seek damages particularized on a claim-by-claim basis.

ARGUMENT

I.   THE INFRINGEMENT JUDGMENT SHOULD BE AFFIRMED

A.   The District Court Correctly Construed "Repeat"

The district court instructed the jury that the claim term "repeat" in the '710 patent meant "generation of additional bits, where generation can include, for example, duplication or reuse of bits." Appx181. It similarly instructed the jury that the '032 patent required "every message bit is repeated, at least two different subsets of message bits are repeated a different number of times." Appx180.

Defendants err in contending that the district court also should have required that

the repetition "generate new, distinct bits" and exclude "reusing bits."

1.   "Repeat" Is Not Limited To Duplication

Contrary to Defendants' assertion (Blue Br. 21), the claims' plain language

requiring "repeating" information bits does not require "generating new, distinct

bits." The claims require repeating but are silent on *how* the repeating is to occur.

Although the repetition that these claims require may include "generating new,

distinct bits," the district court correctly held that the claims are not so limited and

do not exclude the reuse of bits.

Defendants argue that the '710 patent performs operations on "repeated bits"

or "repeats of the message bits." Blue Br. 22-23. But the claims do not state that

the "repeated bits" or "repeats" are new copies of the message bits that are

separately stored in memory. Bits can be used repeatedly without creating new

copies. Nothing in the claims precludes, for example, repeating bits stored in a

single memory location by outputting the value of the original bit multiple times.

Appx10756-10757; Appx10799. As the district court observed, "The claims

simply require bits to be repeated, without limiting how specifically the duplicate

bits are created or stored in the memory." Appx10.

The specifications confirm that "repeating" is not limited to "duplicating."

The specifications nowhere state that "repeated bits" are new copies that are

separately stored. And as the district court observed, the '710 patent describes two

embodiments in which repetition is performed without duplication:

> The Asserted Patents also set forth such an implementation in the
> LDGM coder, which performs the repeat of the message bits using
> matrix multiplication, the output of which is then fed to an inner
> coder, an accumulator that performs additional operations on the
> transitory (repeated and interleaved) bits to produce the final IRA
> codes. . . . . The Asserted Patents set forth another embodiment in the
> form of a Tanner graph, which too discloses repetition without
> expressly creating new copies in memory locations.

Appx11; *see* Appx263 (3:23-65); Appx275 (3:46-49); Appx10754-10758.   For

example, the patents' Figures depicting the Tanner graphs show multiple

information bits emanating from an information node, but depict no separate

storage of the information bits. Instead, the bits go directly from their information

bit location (u1 … uk) and are connected to the place they are summed (v1 … v3):
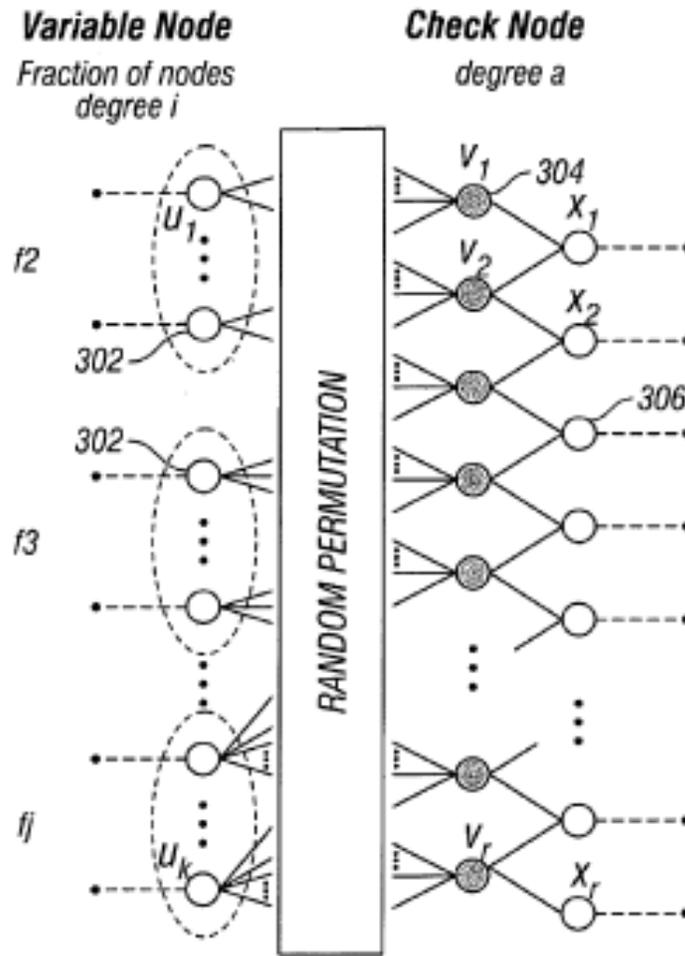
FIG. 3

Appx259. As the district court concluded, the LDGM and Tanner graph examples show that repetition does not require duplication and that Defendants' construction would improperly exclude these embodiments. Appx11.

Defendants nowhere dispute the district court's finding that Defendants' construction would exclude the Tanner Graph embodiment because it does not unequivocally require the duplication of bits. It is therefore undisputed that

Defendants' construction improperly excludes at least one preferred embodiment. That dispositive and unchallenged finding is alone sufficient to affirm the district court's construction. *See Primos, Inc. v. Hunter's Specialties, Inc.,* 451 F.3d 841, 848 (Fed. Cir. 2006) ("[W]e . . . should not normally interpret a claim term to exclude a preferred embodiment.").

Defendants do argue (Blue Br. 24) that the LDGM coder embodiment is not excluded because, although an LDGM coder does not necessarily duplicate bits, it is able to do so. But an LDGM coder can also repeat bits "by simply outputting the value of an original bit multiple times." Appx10756-10757. At most, Defendants' argument shows that repetition can be performed with or without duplication, not that repetition must be limited to duplication.

Defendants similarly err in attempting to import limitations into the claims from the specification. Defendants assert (Blue Br. 24) the specification precludes "repeating" as "reusing" because they contend that one embodiment produces a "block with more output bits than input bits." But as the district court observed, other embodiments, such as the LDGM embodiment of Figure 4 (Appx258), depict fewer output bits than input bits. At most this example shows that duplication can be one form of repeating, not that repeating requires duplication.

Defendants also err in contending the district court was required to credit Defendants' preferred extrinsic evidence. Defendants simply ignore the extrinsic

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evidence that supports the district court's construction. *See* Appx10741 (defining

repeat as "to undergo again" or "to say or do something again"); Appx10750-

10758; Appx10799 (describing a repeat as sending bits multiple times);

Appx10816 (4:30-33) (describing a "repeat transmission" where data "is sent

multiple times").

Defendants also misplace reliance (Blue Br. 22, 24, 25) on the construction

in *California Institute of Technology v. Hughes Communications Inc.*, 35 F. Supp.

3d 1176 (C.D. Cal. 2014) (Pfaelzer, J.). That decision was made in the context of a

summary judgment motion, not a claim construction proceeding, and thus on an

undeveloped record. Moreover, the opinion actually supports the view that the

patent does not limit "repeat" to "duplication," because it rejects a "reuse"

construction by suggesting that the Tanner graph and LDGM implementations do

not unequivocally require reuse, and hypothetically could be used for duplication.

If these embodiments disclose both duplication and reuse, then limiting to just one

of these is incorrect. In any event, even if *Hughes* had concluded that "repeat"

requires "duplication," such a restrictive reading would, as the district court found

here, improperly exclude preferred embodiments and narrowly limit the term to

only one possible implementation of repeating data—storing new copies in

memory.

2.   Defendants Fail To Show Any Prejudice From The "Repeat" Instructions

Even if Defendants could demonstrate error in the repeat construction, they fail to show prejudice. The burden of showing that an alleged claim construction error was prejudicial falls on the appellant. *Network-1 Techs., Inc. v. Hewlett-Packard Co.*, 981 F.3d 1015, 1022 (Fed. Cir. 2020). Prejudicial error requires "sufficient evidence at trial to support a finding of non-infringement under a correct instruction." *Ecolab, Inc. v. Paraclipse, Inc.*, 285 F.3d 1362, 1374 (Fed. Cir. 2002). Defendants have not even contended, much less demonstrated, that the alleged error was prejudicial, and any such argument is therefore waived.

B.   Defendants' Products Satisfy The "Irregularly Repeating" Limitation

1.   Substantial Evidence Supports Literal Infringement

Defendants' arguments based on the "irregularly repeating" limitation lack merit. *First*, Defendants argue (Blue Br. 29) that their encoders do not infringe because the output of the AND gates and multiplexers depends in part on a bit from a parity-check matrix and the output of the AND gate does not *always* match the information bit. But Defendants' own diagram illustrates that the encoders repeat the information bit when it *does* match the bit from the parity-check matrix. When, for example, the information bit is "0" and the bit from the parity-check matrix is "0," the AND gate outputs "0," which is the information bit. The argument, therefore, fails because "[i]t is well settled that an accused device that

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'sometimes, but not always, embodies a claim[] nonetheless infringes.'" *Broadcom Corp. v. Emulex Corp.*, 732 F.3d 1325, 1333 (Fed. Cir. 2013) (quoting *Bell Commc'ns Research, Inc. v. Vitalink Commc'ns Corp.,* 55 F.3d 615, 622–23 (Fed. Cir. 1995)). Even assuming that the device does not repeat bits when the parity-check bit and the information bit do not match, Defendants' diagram shows that the devices repeat the information bit when they do match. *See also* Appx3036-3038; Appx3786.

Second, Defendants argue (Blue Br. 30) that any repetition is not irregular because they contend "each information bit leads to the same number of outputted bits" (emphasis omitted). The argument fails because the jury heard evidence that the overall process constitutes irregular repetition, since the products output and store information bits between two and twelve times. Appx2721; Appx2722; Appx2728; Appx2737; Appx2747-2748; *see also* Appx2810-2812; Appx2830-2831; Appx2836-2837; Appx2842-2843; Appx3034-3035; Appx3080-3081. Defendants' expert agreed that the value outputted by the products' AND gates and multiplexers would be stored in the products' registers a variable number of times, including up to twelve. Appx3792. The jury was therefore presented with substantial evidence that the repetition was irregular.

2.   Substantial Evidence Supports Infringement Under The Doctrine of Equivalents

Because there was substantial evidence of literal infringement, the Court need not reach Defendants' arguments concerning infringement by equivalents. *See i4i Ltd. P'ship v. Microsoft Corp.*, 598 F.3d 831, 849 (Fed. Cir. 2010). Nevertheless, the verdict of infringement by equivalents is supported by substantial evidence. Appx2853-2860.

> The jury heard testimony from expert witness Dr. Matthew Shoemake that:

> the goal of the repetition . . . is to repeat such that the information bits can appear in different sums. . . . [T]he exact circuitry required would be an insubstantial difference when it comes to 'repeat.' You can look at the claim language itself. It just requires repeating. It doesn't require repeating with any type of specific circuitry. It doesn't even say if you have to do it in hardware versus software. So how the repeating actually gets implemented, whether that is storing the bits in memory or reusing them, is an insubstantial difference. . . . . So recall that the mac_reg modules are used to generate the repetition, and it's doing the same thing. It's doing an LDGM multiply to form the sums of information bits. [A] person of ordinary skill in this art would understand that that repetition is so the information bits can appear in multiple sums. Like I showed you, I-1 goes and it appears in two sums and so on. . . . And the overall goal is to get those information bits into different sums. So based upon my analysis, even if this claim limitation with respect to repeat isn't literally infringed, it would still be infringed under the doctrine of equivalents because the differences in the hardware with respect to how repeat is implemented are inconsequential, not substantial differences.

Appx2856-2859.

Defendants err in arguing (Blue Br. 32) that Dr. Shoemake only testified "at most" that the patents and the accused products share an "overall goal." As can be

seen from the testimony quoted above, that is incorrect. Dr. Shoemake testified that the difference between the claim limitation and Defendants' characterization of the operation of the products was insubstantial.

Defendants' argument (Blue Br. 32) that Dr. Shoemake's testimony does not satisfy this court's "function, way, result" test for equivalence ignores that equivalence can also be shown through testimony that the "accused device contains an element that is not 'substantially different' from any claim element that is literally lacking," *Kraft Foods, Inc. v. Int'l Trading Co.*, 203 F.3d 1362, 1371 (Fed. Cir. 2000), which is the test Dr. Shoemake applied, Appx2858. For the reasons stated above, there is substantial evidence that the "not substantially different" test is satisfied, Defendants make no argument that this test was not met, and any such argument is therefore waived.

3.   The "Variable Number Of Subsets" Instruction Was Proper

Defendants argue (Blue Br. 26-27) that the district court erred by not instructing the jury that the claim term "variable number of subsets" from the '781 patent requires "irregular repetition of information bits." Through this argument, they seek to import the "repeat" and "irregular" claim terms from the '710 patent into claim 13 of the '781 patent. Defendants' argument fails on three grounds.

First, Defendants waived this argument because they stipulated to the construction of "variable number of subsets." They cannot now complain that the

construction was incomplete or inaccurate. "The fact that shortly before trial [a party] became dissatisfied with its own proposed construction and sought a new one does not give rise to an *02 Micro* violation." *Nuance Commc'ns, Inc. v. ABBYY USA Software House, Inc.*, 813 F.3d 1368, 1373 (Fed. Cir. 2016); *see also Akamai Techs., Inc. v. Limelight Networks, Inc.,* 805 F.3d 1368, 1376 (Fed. Cir. 2015) (no *O2 Micro* error where "the parties *agreed* in the stipulation as to both the meaning and the scope of the term during claim construction" and concluding that the defendant could not "argue at the jury instruction stage . . . that the construction was somehow too broad"). Defendants agreed that "variable number of subsets" should be construed as "some information bits are used in more mod-2 or exclusive-OR operations (i.e., more 'subsets') than others." Appx75. The district court, therefore, acted within its discretion in declining to instruct the jury in a manner different than Defendants had previously agreed. Appx207.

Second, Defendants have not demonstrated that the court's construction was either incorrect or incomplete. "A party has no vested right in its own carefully couched form of words in an instruction, because 'the court is not required to give instructions in the language and form requested.'" *Biodex Corp. v. Loredan Biomedical, Inc.*, 946 F.2d 850, 854 (Fed. Cir. 1991) (quoting *Oliveras v. U.S. Lines Co.,* 318 F.2d 890, 892 (2d Cir. 1963)). Where the construction is "sufficient to resolve the parties' dispute over the scope of" the claim, there is no error in

failing to adopt the appellant's preferred construction. *GPNE Corp. v. Apple Inc.*, 830 F.3d 1365, 1373 (Fed. Cir. 2016). The "court need not attempt the impossible task of resolving all questions of meaning with absolute, univocal finality." *Eon Corp. IP Holdings v. Silver Spring Networks*, 815 F.3d 1314, 1318 (Fed. Cir. 2016).

The jury instruction was both correct and complete because it captured the specific type of irregular repetition that the claim requires. Defendants contend (Blue Br. 26) the court should have construed the claim to require "irregular repetition." As the district court observed, "there is 'irregular' repetition of information bits [in the '781 patent] because i2 appears in more subsets than i1 and i3." Appx78. In other words, the plain claim language makes clear that the repetition is "irregular" because it states that some bits are used in more subsets than others. The instructions and plain claim language, therefore, accurately address the specific type of irregular repetition that the claim requires. *See* Appx207.

Third, Defendants have not argued, much less shown, that any alleged instructional error with respect to the "variable number of subsets" limitation was prejudicial. *See Network-1 Techs.*, 981 F.3d at 1022; *CytoLogix Corp. v. Ventana Med. Sys., Inc.*, 424 F.3d 1168, 1174 (Fed. Cir. 2005). Any argument for new trial on this basis thus is now waived.

C.   Defendants' Products Satisfy The "Sum Of Bits" Limitation

Defendants err in arguing (Blue Br. 33-36) that the accused chips do not

practice the "accumulation of mod-2 or exclusive-OR sums of bits in subsets of the

information bits" limitation of the '781 patent, which the parties stipulated meant

"adding together two or more information bits" (Appx6577-6578). As the district

court correctly concluded, there was substantial evidence at trial that the accused

products add together information bits. Appx208.

Defendants do not dispute that the output of the logic gates are "bits," that

those bits contain "information," or that they are "binary digits." Defendants cite

nothing in the intrinsic or extrinsic evidence to support any construction that logic

gates cannot output "information bits."   Instead, Defendants cite only their

attorney's summary judgment argument that these outputs are not information bits,

not testimony at trial. Blue Br. 35 (citing Appx9947-9948).

Not only is attorney argument not evidence, the jury actually heard

testimony that the products do sum information bits. Indeed, Defendants' own

expert stated in his initial expert report, under penalty of perjury, that the accused

products "sum[] information bits in the mac_reg modules."   Appx3799-3807.

Although Defendants' expert would later serve a "corrected" expert report that

disavowed that statement, the jury was entitled to rely on it and find infringement.

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Fed. R. Evid. 801(d)(1)(A) (inconsistent statements made under oath prior to trial are not hearsay).

In addition, the jury heard testimony from Dr. Shoemake that the accused products sum information bits, that the information bits pass through the products' logic gates, and that the output of those logic gates are the information bits. *E.g.*, Appx2723 ("Whenever the information bits go in, the actual hardware adds them up as they come in. So what's sitting in this register inside the accused products . . . is that there's a sum of information bits sitting here."); Appx2730 ("And each of these lines, again, represents an information bit and we see them coming together. And that means that they're being summed . . . ."); Appx2764 ("[W]hen multiple information bits go into the same location, they get summed with that little caret sign that means binary addition."); *see also* Appx2773; Appx2826-2828; Appx4144-4145. Dr. Shoemake also explained that the summing an information bit with either a reset value or logic gate output results in the same information bit, since the reset value and logic gate outputs were equal to zero. Appx4147-4148. And Defendants' expert agreed that the original information bit "propagates all the way through" the logic gates. Appx3793. Indeed, Defendants concede (Blue Br. 35) that Dr. Shoemake testified that the output of the logic gates, which the products sum, are information bits. The jury was entitled to rely on that testimony,

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especially in light of the inconsistencies between Defendants' expert's own prior statements and his trial testimony.

II.   CLAIM 13 OF THE '781 PATENT IS PATENT-ELIGIBLE

The district court concluded after multiple rounds of briefing that claim 13 of the '781 patent was directed to the non-abstract idea of "a method for encoding data that . . . improves on previous data encoding methods by allowing for more efficient data transmission." Appx88. Defendants err in contending (Blue Br. 37) that the claim is instead directed to a "mathematical algorithm of accumulating sums of inputs."

As the district court found, the claim is directed to "improv[ing] an existing technological process." *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335-36 (Fed. Cir. 2016) (quoting *Alice*, 573 U.S. at 223); *see Core Wireless Licensing S.A.R.L. v. LG Elecs., Inc.*, 880 F.3d 1356, 1361-62 (Fed. Cir. 2018) (finding eligible claims that were "directed to a specific improvement in the capabilities of computing devices"); *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1314 (Fed. Cir. 2016) (finding eligible claims that "focus on a specific means or method that improves the relevant technology"). The claim recites a "specific improvement over prior systems" in the narrow field of error correction for digital communications. *Core Wireless*, 880 F.3d at 1363. This improved technological process for digital communications also improves the operation of

computers themselves. *See Enfish*, 822 F.3d at 1338; Appx2634-2641 (explaining how the inventions improve the speed, power consumption, temperature, reliability, size, battery life, and range of the accused products).

Defendants err in arguing that the district court erred in its *Alice* step one analysis. *First*, they argue (Blue Br. 38) that the district court's characterization of the claim was error because the goal of allowing more efficient data transmission is articulated in the specification, not the claim language itself. But this Court "ha[s] found the specification helpful in illuminating what a claim is 'directed to.'" *ChargePoint, Inc. v. SemaConnect, Inc.*, 920 F.3d 759, 766 (Fed. Cir. 2019). It was, therefore, not improper for the district court to consider the specification in its step one analysis.

Second, Defendants contend (Blue Br. 38) that claim 13 is directed to an abstract mental process because the claim does not specifically recite computer circuitry. But Defendants cite no case so holding, and the district court correctly held that the law imposes no such requirement. Appx90 (quoting *TQP Development, LLC v. Intuit Inc.*, 2:12–CV–180, 2014 WL 651935 (E.D. Tex. Feb. 19, 2014 (Bryson, J., sitting by designation)). In *Enfish*, 822 F.3d at 1339, this Court held that the fact "that the improvement is not defined by reference to 'physical' components does not doom the claims." To hold otherwise "risks resurrecting a bright-line machine-or-transformation test . . . or creating a

categorical ban on software patents." *Id*. A computer-based invention is not abstract merely because the claim does not recite physical components. A claim is not directed to an abstract idea where "the claimed solution is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer[s] . . . ." *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014).

Third, Defendants gain nothing by citing (Blue Br. 38) "Caltech's trial arguments" that the claim does not require any particular circuitry. The district court's opinion is not premised on particular circuitry. Nor did Defendants seek reconsideration of the summary judgment order in light of the trial record, and the argument is therefore waived. *See Old Chief v. United States,* 519 U.S. 172, 182 n.6 (1997) (cautioning against "review by hindsight").

Because it correctly found the claim patentable at *Alice* step one, the district court did not need to reach *Alice* step two. Any contrary finding by this Court should result in a remand to the district court for application of step two in the first instance.

III. **THE PRIOR ART INVALIDITY AND INEQUITABLE CONDUCT RULINGS SHOULD BE AFFIRMED**

A.   **The District Court Correctly Interpreted IPR Estoppel**

Section 315(e)(2) states that estoppel extends to "*any ground* that the petitioner raised or *reasonably could have raised* during that inter partes review"

(emphasis added). While this litigation was proceeding, Defendants filed ten IPR petitions challenging the validity of Caltech's patents. Appx39. The district court observed after multiple rounds of briefing that, "at the time Defendants were filing IPR petitions, they were aware of all the prior art that they now use to support their invalidity arguments." Appx50. The district court, therefore, properly held that Defendants' prior art defenses were precluded.

Defendants do not dispute that they reasonably could have raised in the IPR petitions the invalidity grounds that the district court held were precluded. Instead they contend (Blue Br. 40) that estoppel extends only to those invalidity defenses on which the PTAB actually instituted the IPR, even if the petitioner was aware of other defenses it intentionally excluded from its petition. This narrow reading of the statute is contrary to its plain language, legislative history, and purpose.

First, allowing estoppel to attach only to the invalidity grounds ultimately addressed in the PTAB's Final Written Decision would render superfluous the phrase "reasonably could have raised" in Section 315(e)(2). *See SiOnyx, LLC v. Hamamatsu Photonics K.K.*, 330 F. Supp. 3d 574, 602 (D. Mass. 2018) ("[F]or the words 'reasonably could have raised' to have any meaning at all, they must refer to grounds that were not actually in the IPR petition, but reasonably could have been included."). The only invalidity ground that Defendants' interpretation would, as a practical matter, preclude would be those *actually* raised in the petition.

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Defendants dispute this conclusion, making the implausible argument (Blue Br. 42) that "reasonably could have raised" preclusion should apply only to the rare case where the petitioner includes a ground in the petition, the PTAB institutes on that ground, but the petitioner withdraws that ground after institution. That Congress contemplated such an unlikely scenario beggars belief. Under Defendants' interpretation, "[t]he reach of estoppel would, as a practical matter, be defined out of existence." *Asetek Danmark A/S v. CoolIT Systems Inc.*, 19-cv-410, 2019 WL 7589209, *7 (N.D. Cal. Dec. 30, 2019). Defendants' argument is also contrary to the plain language of the statute because instituted but withdrawn grounds are not grounds that "reasonably could have been raised." Those are grounds that were *actually* raised in the proceedings, even if they were later withdrawn.

Second, the legislative history is also contrary to Defendants' interpretation. During hearings, then-Director Kappos testified:

> I believe there are significant advantages for patentees who successfully go through the post-grant system ... because of those estoppel provisions. Those estoppel provisions mean that your patent is largely unchallengeable by the same party.

America Invents Act: Hearing on H.R. 1249 Before the House Comm. on the Judiciary, 112th Cong. 52-53 (2011). Yet Defendants' interpretation would allow petitioners to withhold grounds from their petition and raise them in a later proceeding. One of the key architects of the America Invents Act similarly

explained that estoppel was intended to include prior art that was known or that "a skilled searcher conducting a diligent search reasonably could have been expected to discover." 157 Cong. Rec. S1375 (daily ed. Mar. 8, 2011) (statement of Sen. Kyl).

Defendants misplace reliance (Blue Br. 39-40) on cases that predate *SAS Institute, Inc. v. Iancu*, 138 S.Ct. 1348, 1355 (2018), such as *Shaw Industries Group, Inc. v. Automated Creel Systems, Inc.*, 817 F.3d 1293, 1300 (Fed. Cir. 2016), and *HP Inc. v. MPHJ Tech. Inv., LLC*, 817 F.3d 1339, 1347 (Fed. Cir. 2016). Prior to *SAS*, the PTAB sometimes instituted review on less than all grounds in a petition. *Shaw* and *HP* held that, under such circumstances, the petitioned-for but non-instituted grounds were not estopped. *Shaw*, 817 F.3d at 1300; *HP*, 817 F.3d at 1347. *SAS*, however, held that the PTAB was required to institute or deny IPR petitions in their entirety. 138 S. Ct. at 1359-60. That holding effectively made impossible the situation at issue in *Shaw* and *HP*. There can no longer be such a thing as a ground raised but not instituted in an otherwise instituted IPR petition.

The case at bar, in any event, concerns non-*petitioned* grounds, not petitioned-for but non-instituted grounds, as was the case in *Shaw* and *HP*. Defendants here did not include the precluded obviousness combinations in their petitions. It may have made sense pre-*SAS* that petitioned-for but non-instituted

grounds did not give rise to estoppel because a petitioner could not—through no fault of its own—raise those grounds in the PTAB after the institution decision. But when a petitioner does not raise grounds in its petition that it reasonably could have, as is the case here, the PTAB has not hindered the pursuit of those defenses through IPR, and preclusion is appropriate.

B.   The District Court Correctly Granted Summary Judgment Of No Inequitable Conduct

Defendants fail to show (Blue Br. 42-45) that the district court improperly granted summary judgment of no inequitable conduct (Appx102-112). The district court found that Defendants could not establish materiality, which generally requires proof that, had the prior art been disclosed, the patent claim would not have issued, *see Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1291 (Fed. Cir. 2011) (en banc). Defendants alleged inequitable conduct based on the failure to disclose three references: Luby97, Luby98 (collectively "Luby") and Richardson99. Appx105. The district court granted summary judgment that none of the three references was material in part because Luby was disclosed during IPR and the PTAB nevertheless found the claims patentable. Appx108. Although Richardson99 was not disclosed during IPR, the court noted that Defendants failed to articulate any meaningful difference between Richardson99's and Luby's

disclosures. Appx110-112.[2] Defendants' challenges to that ruling fail for three reasons.

First, the district court properly found (Appx110-111) that Defendants waived any argument that Richardson99 was material because its disclosures are allegedly different from Luby. Defendants fail to acknowledge the court's multiple grounds for finding waiver, and any challenge to them is now itself waived. Defendants did not contend that Richardson99 differed materially from Luby in their Answer as required by Rule 9(b), but alleged instead "that Richardson99 'provides a similar disclosure' to Luby98." Appx110-111; *see generally Exergen Corp. v. Wal-Mart Stores, Inc.*, 575 F.3d 1312, 1328-29 (Fed. Cir. 2009). Defendants also failed to describe any comparison between Richardson99 and the patents in their "supplemental interrogatory responses." Appx110-111; Appx10858-10859. Nor did Defendants' briefing on materiality explain how disclosure of Richardson99 would have led to a finding of unpatentability of any specific claim. Appx111; Appx10889-10890.

Second, Defendants' new arguments that Richardson99 was material are waived because they are presented for the first time on appeal. *See Finnigan Corp.*

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[2] Defendants misplace reliance (Blue Br. 42-43) on *California Institute of Technology v. Hughes Communications, Inc.*, 2:13-cv-7245, 2015 WL 11089495 (C.D. Cal. May 5, 2015), which held there were disputes of material fact regarding materiality. The district court here based its ruling on the PTAB's finding of patentability over Luby, which occurred after the decision in *Hughes*.

v. ITC, 180 F.3d 1354, 1363 (Fed. Cir. 1999). Defendants now argue (Blue Br. 44) that the PTAB considered Luby "for only the '710 and '032 patents" and Richardson99 might be material to the different claims at issue on appeal. But the district court noted that the only materiality analysis that Defendants provided with respect to claims not at issue in the IPRs (e.g., the claims at issue in this appeal) was with respect to (now unasserted) claim 9 of the '781 patent. Appx111. Even with respect to that claim, the entirety of Defendants' analysis was the conclusory statement that the "[t]he additional limitations of claim 9 are every bit as invalid" as other claims the PTAB had invalidated. Appx111. The district court correctly concluded that this cursory analysis was not sufficient to meet Defendants' burden of showing that, had Richardson99 been disclosed, the claims in this appeal would not have issued. Appx111. Yet Defendants now cite (Blue Br. 45 (citing Appx8287-8288)) specific portions of Richardson99 that they did not cite in the briefing below and thus waived.

Third, even if not waived, Defendants' materiality argument fails on the merits. As an initial matter, Defendants fail to even identify the patent claims to which Richardson99 is supposedly material. Although Defendants argue that Richardson99 discloses irregular repetition, that does not show that each limitation of any claim is disclosed by some combination of Richardson99 and other disclosed references. Nor do they explain how the "irregular repetition" disclosed

in Richardson99 substantially differs from the "irregular repetition" disclosed in

Luby, which was disclosed during the IPRs and which the PTAB found did not

render the claims obvious. And although Defendants argue (Blue Br. 44 n.9) that

the PTAB rejected their IPR challenge "because it found no motivation to

combine" Luby with other references, they failed in the district court and fail now

on appeal to argue or cite any evidence showing a motivation to combine

Richardson99. There is thus no basis to conclude that any claims would have been

found obvious in light of Richardson99 and any other reference.

C.   The District Court Properly Limited The Use Of Prior-Art Evidence At Trial

Federal Rule of Evidence 403 authorizes a district court to exclude relevant

evidence if its probative value is substantially outweighed by a danger of unfair

prejudice. Contrary to Defendants' argument (Blue Br. 45-48), the district court

was well within its discretion in excluding the prior-art references they relied on in

support of "practicing the prior art" and "independent development" defenses.

Appx168; *see* Appx162-163; Appx237-238. Where invalidity is not at issue, the

admission of prior art can create a danger that the jury will consider prior art for

that prohibited purpose. *See Apple Inc. v. Samsung Elecs. Co., Ltd.*, 786 F.3d 983,

1000-01 (Fed. Cir. 2015), *rev'd on other grounds*, 137 S.Ct. 429.   Because

Defendants' obviousness defenses were precluded, the validity of the asserted

claims was not at issue at trial.   Nevertheless, based on Defendants' pretrial

submissions, the district court observed that Defendants "obfuscate[d] both (1) the purposes Defendants would seek to introduce particular references at trial and (2) the places in Defendants' expert reports where Defendants relied on a particular prior art reference for a particular purpose that they would now seek to introduce it at trial." Appx161. The district court also found, and Defendants do not dispute, that they intended to present the prior art for purposes of advancing "practicing the prior art" and "independent development" defenses. Appx168. Such use would have been improper. *See In re Omeprazole Patent Litig*., 536 F.3d 1361, 1377 (Fed. Cir. 2008) ("It is well established, however, that 'practicing the prior art' is not a defense to infringement."); *Allen Eng'g Corp. v. Bartell Indus., Inc*., 299 F.3d 1336, 1351 (Fed. Cir. 2002) (holding that copying "is of no import on the question of whether the claims of an issued patent are infringed").

In light of Defendants' evident intent to backdoor their precluded obviousness defenses into trial and use the prior art for improper purposes, the district court acted within its discretion when it ruled that prior art could be used, to the extent specifically identified in an expert report, only to prove the state of the art and to show non-infringing alternatives, to rebut allegations of copying and willfulness, and to show how it "may have informed the development of the accused products." Appx161; Appx168. Defendants err in asserting (Blue Br. 45) that the district court "limited Appellants to a handful of specific references—*of*

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Caltech's choosing" (emphasis in original). Defendants cite no order applying such a procedure. To the contrary, Defendants were allowed to introduce prior art other than "their main invalidity prior art" that had been properly disclosed during discovery. Appx161; Appx168. Defendants' assertion on appeal that the court "prevented [it] from road-mapping the state-of-the-art" at trial (Blue Br. 48) is, therefore, false.

Defendants argue (Blue Br. 46) that the district court permitted Caltech to question witnesses about the prior art in greater detail. But they did not object to the questioning about which they now complain. *See* Appx2346-2353; Appx2356; Appx2366-2370.

Nor have Defendants shown that any alleged abuse of discretion was prejudicial. *See* Fed. R. Evid. 103(a); *Siemens Medical Solutions USA, Inc. v. Saint-Gobain Ceramics & Plastics, Inc.*, 637 F.3d 1269, 1285 (Fed. Cir. 2011) (Rule 403 exclusion not grounds for reversal if error was harmless). Defendants do not even argue, much less show, that the permitted prior art was inadequate to illustrate the state of the art. Nor do they identify what prior art reference specifically should have been admitted or what part of that reference is relevant. Defendants fail, for example, to identify any teaching in the excluded prior art that was not cumulative of admitted prior art or uniquely necessary to give a full picture of the "state of the art." *See Symbol Techs., Inc. v. Opticon, Inc.*, 935 F.2d

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1569, 1579 (Fed. Cir. 1991) (erroneous exclusion of prior art harmless where the excluded art added little to the scope of the admitted art). There is, therefore, no basis to conclude that the court's Rule 403 balancing was an abuse of discretion or that any alleged error was not harmless.[3]

IV.   THE DAMAGES JUDGMENT SHOULD BE AFFIRMED

Defendants' challenges to the damages judgment (Blue Br. 48-68) lack merit. Caltech introduced testimony from two damages experts, Dr. David Teece and Catharine Lawton, that presented a reasonable-royalty theory of damages based on hypothetical negotiations between Caltech and each defendant in December 2009. Appx3342. Caltech's experts testified that the negotiation with Apple would have involved a "device-level" license for infringing devices that Apple imports into the United States, and the negotiation with Broadcom would have involved a "chip-level" license for Broadcom's Wi-Fi chips. Appx3312-3314; Appx3330-3332; Appx3342; Appx3423-3424.   To avoid any double recovery, Caltech's experts calculated Apple's damages by applying a per unit royalty rate to the devices that Apple imports into the United States, and Broadcom's damages by applying a per unit royalty rate to: (1) chips that Broadcom sold to Apple in the United States that go into Apple devices that were

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[3]   *Exmark Mfg. Co. v. Briggs & Stratton Power Products Group, LLC*, 879 F.3d 1332, 1352 (Fed. Cir. 2018), is distinguishable. That decision holds that prior art is not irrelevant simply because it was not commercialized. The district court here did not exclude prior art on that basis.

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not imported into the United States; and (2) chips Broadcom imported into the United States that were not sold to Apple. Appx3312-3314; Appx3331-3332; Appx3373-3378. Caltech's experts testified that there was no overlap between the two royalty bases and therefore "no double counting." Appx3312-3313; Appx3423-3424.

For each negotiation, Caltech's experts derived a starting royalty rate from a comparable patent license. For the Apple negotiation, the most comparable license was one Caltech gave Hughes for the patents-in-suit. Appx3333-3337. Hughes manufactures set-top boxes that, like Apple's products, are consumer devices. Appx3334. Ms. Lawton testified that the Hughes license provided for an effective royalty rate of $1.13 per unit. Appx3336 (accounting for the lump sum nature of the Hughes license by imputing a per unit royalty to the license based on the volume of Hughes' sales).

For the Broadcom negotiation, the most comparable license was an agreement between Broadcom and Australia's Commonwealth Scientific and Industrial Research Organization ("CSIRO") for patents involving Wi-Fi technology practiced by some of the [contract provision] Broadcom chips. Appx3478. CSIRO, like Caltech, is a scientific research institute that generated revenue through licensing. Appx3339. The CSIRO license involved a technologically comparable patent on error-correction technology, though the technology was

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inferior to Caltech's patents.   Appx2880-2881; Appx3439-3440.   The CSIRO

license provided for an effective royalty of [number] per unit. Appx3340.

Dr. Teece adjusted the royalty rates from these agreements to account for

differences from the factual circumstances of the hypothetical negotiations.

Appx3333-3340; Appx3432-3442; Appx3472-3485.   With respect to the Apple

hypothetical negotiation, Dr. Teece testified that adjustments were warranted to

account for the hypothetical negotiation's assumption of validity and infringement,

the importance of the technology to Apple's "ecosystem," the importance of

premium Wi-Fi to Apple's products (including the improved speed, range,

reliability, battery life, and power consumption that the patents offered), and the

inferiority of noninfringing alternatives. Appx3435-3438. Dr. Teece also relied on

the fact that Defendants' damages expert (who Defendants did not call at trial), had

opined in previous litigation that a reasonable royalty for the Caltech patents was

[number] per unit. Appx3475. Based on this evidence, Dr. Teece concluded that

the hypothetical negotiation with Apple would result in a $1.40 per unit royalty.

Appx3432; Appx3441; Appx3473-3474.

With respect to the Broadcom hypothetical negotiation, Dr. Teece testified

that adjustments to the CSIRO license rate of [number] per unit were warranted to

account for the technological superiority of Caltech's patents relative to the CSIRO

patent, the hypothetical negotiation's assumption of validity and infringement, the

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fact that Broadcom required the technology to win Apple's business, the inferiority

of noninfringing alternatives and the substantial cost of licensing those alternatives

Appx3438-3441; Appx3477-3483.   Dr. Teece concluded that the hypothetical

negotiation with Broadcom would result in a payment of $0.26 per chip.

Appx3483-3485.

The damages judgment should be affirmed in all respects.

A.   The Separate Royalty Rates For Apple And Broadcom Are Legally Proper And Supported By Substantial Evidence

Contrary to Defendants' argument (Blue Br. 49-56), the district court

properly admitted Caltech's expert damages testimony that separate hypothetical

negotiations with each defendant would have resulted in two different royalty

rates, and substantial evidence in the record supports that conclusion.   Apple's

repeated protest that the same technology could not have resulted in two different

rates mistakenly ignores the settled law of hypothetical negotiation constructs, as

the district court correctly found (Appx225-230).

First, a reasonable royalty based on a hypothetical negotiation must be based

on the specific value of the patented technology to the defendant in question, *see*

Georgia-Pacific Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y.

1970), and "the incremental value that the patented invention adds to the end

product," *Ericsson, Inc. v. D-Link Sys.*, 773 F.3d 1201, 1226 (Fed. Cir. 2014).   It

should be no surprise that the value of patented technology is different for Apple

than for Broadcom when, as the district court noted, they are at different levels in the supply chain, made different products, and derived different value from the invention. Appx225-226. For example, some benefits from the invention such as speed, extended battery life, reduced power consumption, reduced temperature, and reduced battery size (Appx2635-2640) are of greater value in mobile devices like Apple's products than they would be in other devices incorporating a Wi-Fi chip, such as a smart television or other smart appliances.

Second, separate royalty rates for each defendant were appropriate because the jury was free to reach different liability determinations for each defendant's separate infringing acts and each defendant was free to raise separate defenses. The hypothetical negotiation is a tool for measuring a defendant's damages, but Caltech is entitled to collect those damages from either Apple or Broadcom, as long as it does not collect from both. There is no reason to suppose the damages model for each defendant must be the same.

Nor do this Court's cases suggest as much. Contrary to Defendants' suggestions (Blue Br. 49, 51), *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51 (Fed. Cir. 2012), did not hold that there should be a single hypothetical negotiation that applies to all infringing entities or that all parties who infringe a patent should pay the same royalty rate—issues that were not before the Court. That case concerned only whether the correct hypothetical negotiation date for

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induced infringement was the date of first inducement or the date the defendant

first became liable for inducement (after receiving knowledge of the patent). *Id*. at

75-76.   Because the direct infringers were not parties, separate hypothetical

negotiation dates for two different infringing parties was not at issue. *Id*. at 76.

Stickle v. Hueblein, Inc., 716 F.2d 1550 (Fed. Cir. 1983) (cited Blue Br. 51),

is also inapposite. *Stickle* explained that, "[o]nce full recovery is obtained from

one infringer with respect to a particular infringing device, at most nominal

additional damages may be awarded against another with respect to the same

device." *Id*. at 1562. But Caltech did not seek and the jury did not award "full

recovery" from Broadcom and damages were not awarded more than once for each

accused product. To the contrary, Caltech sought recovery from Apple for Apple's

products sold in the United States, and sought recovery from Broadcom for an

entirely different set of products (Appx3312-3313; Appx3423-3424), so there was

no double counting here, as the district court correctly found (Appx228).

Defendants misplace reliance on *Stickle*'s statement that, "*in terms of this

case*, the quantum of [the plaintiff's] recovery for an infringing fryer does not

depend on whether [the purchaser] or [the manufacturer] is the defendant." *Id*.

(emphasis added). *Stickle* concerned a very different issue with very different

evidence. The district court there awarded a royalty based on a percentage of all

taco sales made by the purchaser of an infringing fryer. *Id*. at 1557. This Court

reversed, however, because the evidence compelled a finding that the hypothetical negotiation would have resulted in a single lump sum royalty payment. *Id*. at 1561-63. That holding is irrelevant here.

Defendants are also wrong to suggest (Blue Br. 51) that *Carucel Investments, L.P. v. Novatel Wireless, Inc.*, 16-cv-118, 2017 WL 1215838 (S.D. Cal. Apr. 3, 2017), a case cited by the district court (Appx226-228), is inconsistent with *LaserDynamics* or *Stickle*. In fact, the court in *Carucel* discussed *Stickle* and found under facts materially identical to those here that *Stickle* was inapplicable because there had "not yet been a full recovery from one infringer." *Carucel*, 2017 WL 1215838, at *9.

Defendants' reliance (Blue Br. 50) on *Quanta Computer, Inc. v. LG Electronics, Inc.*, 553 U.S. 617 (2008), fails for similar reasons. *Quanta* holds that "[t]he authorized sale of an article that substantially embodies a patent exhausts the patent holder's rights and prevents the patent holder from invoking patent law to control postsale use of the article." *Id*. at 638. Here, Broadcom never "received a license," there has been no authorized sale of any Broadcom chips, and Caltech neither sought nor recovered more than one royalty on any given infringing product.

Third, Defendants err in contending (Blue Br. 51-52) that the "smallest saleable patent practicing unit" ("SSPPU") principle requires that Broadcom and

Apple pay the same royalty rate. The SSPPU principle relates to apportionment of

the royalty base. It provides that, "where multi-component products are accused of

infringement, the royalty base should not be larger than the smallest salable unit

embodying the patented invention." *Power Integrations, Inc. v. Fairchild*

Semiconductor, Inc., 904 F.3d 965, 977 (Fed. Cir. 2018). The principle says

nothing about whether two different defendants must pay the same or different

royalty rates for infringing the same patents through different products. And,

where, as here, damages are calculated using comparable license agreements, the

SSPPU principle is inapplicable because such a model does not apportion damages

from a royalty base. *Commonwealth Sci. and Indus. Research Org. v. Cisco Sys.,*

Inc., 809 F.3d 1295, 1302-04 (Fed. Cir. 2015). The comparable licenses provide a

proxy for the value of the invention and, thus, "already built in apportionment."

Id. at 1303; *see Elbit Sys. Land and C4I Ltd. v. Hughes Network Sys.*, 927 F.3d

1293, 1302 (Fed. Cir. 2019). As the district court noted (Appx229), Caltech's

damages experts permissibly determined the royalty base using an approved

"methodology that values the asserted patent based on comparable licenses" rather

than using the SSPPU.

   Finally, Defendants' remaining arguments about the separate royalty rates

(Blue Br. 52-56) amount to factual quarrels that were the province of the jury to

resolve. The jury heard expert damages testimony that "licensing practices in the

industry [are] that an end device level royalty would have been the result of a hypothetical negotiation between Apple and Caltech" (Appx3345), that "[w]hat happens with technology like Caltech's, particularly with fundamental enabling technology, is you get the best vista into what it's worth when it's in the hands of the ultimate user," that Caltech would have been motivated to separately "negotiate with Apple at the device level because that is where value is most clearly revealed," that "as you move downstream, the value becomes more transparent," and that "[m]ost licensors . . . prefer to focus on licensing at the end consumer product" (Appx3424-3427). The record also contains licenses at both the end-user-device level (Hughes license for set top boxes) and at the chip level (CSIRO chip license to Broadcom). Appx3333-3334; Appx3338-3340. Defendants presented no contrary expert testimony at trial, and fail in their effort to show the contrary now.

For example, the [contract provision] provision of the MDSA (Blue Br. 53) does not require a single negotiation. It requires Broadcom to [contract provision] Apple if Apple so requests, but conspicuously does *not* require Broadcom to take a license for Apple. The MDSA does not preclude Apple from negotiating on its behalf, does not dictate the structure of negotiations, and does not dictate that any license impose the same rate for chips and devices. Appx6059. And as Dr. Teece

testified, the law requires an assumption that Apple is a willing licensee who cannot simply say "let Broadcom do it and try and pass the buck." Appx3423.

Similarly, that the Hughes and CSIRO licenses lacked [contract provision] (Blue Br. 53-54) may permit an inference that the hypothetical negotiations here would have been similar, but it does not compel that conclusion in the face of the contrary evidence cited above.

Defendants likewise err in arguing (Blue Br. 54-55) that the hypothetical licensor would have been Inforon, a third party licensee of the asserted patents, rather than Caltech. As the district court found, Defendants' arguments ignore substantial evidence to the contrary. Appx220-221. The Inforon agreement states that Caltech retained control of patent enforcement. Appx6012. The jury heard evidence that Caltech had exercised that right in the past to take over licensing negotiations, because due to Inforon's small size, it was "not in a position to actually negotiate fairly against these large companies," that Caltech had a licensing office and experience, that Inforon was in default on the contract, and that Caltech would have exercised its right to control negotiations with Apple and Broadcom. Appx3205-3207; Appx3428-3429. Further, the undisputed expert testimony was that the outcome of the hypothetical negotiation would have been the same if Inforon had been the licensor. Appx3429.

Nor have Defendants shown (Blue Br. 54-55) how admission of evidence concerning a December 2009 date of the hypothetical negotiations was prejudicial. The undisputed expert testimony was that differences of a few weeks in the date of the negotiations would not have altered the result. Appx3427. While Defendants assert (Blue Br. 54-55) that "the first allegedly infringing act by Broadcom, the chip maker, would naturally come before the first allegedly infringing act by Apple, the end-device maker," they cite nothing in the trial record to support that attorney argument, and the expert reports they cite are not part of the trial record. As the district court observed, the jury heard evidence "regarding the relationship between Apple and Broadcom in the design and development of the chips" that supported a finding that they [contract provision] the infringing products and began infringing at substantially the same time. Appx220 (citing Appx3252 (Broadcom [contract provision] infringing chips for Apple)); Appx3255 (chips imported to both Defendants in December 2009); Appx3289-3290 (Defendants [contract provision] infringing chips); *see also* Appx3253-3255 (similar); Appx10478-10479 (Defendants [contract provision] infringing chips). The jury also heard testimony that licensors generally prefer to license at the end consumer product level. Appx3427. Defendants introduced no expert testimony to rebut this evidence or show an alternative date of first infringement, and the jury was entitled to credit it. Appx219-220.

B.   The District Court Properly Allowed Caltech's Expert Testimony Concerning The Royalty Amounts

Defendants err in their multiple attacks (Blue Br. 56-60) on Dr. Teece's damages opinions. As the district court was within its discretion in finding, the Hughes agreement "is the only existing agreement to the asserted patents," and the CSIRO agreement "involved a precursor Wi-Fi technology to that of the asserted patents, and implicated some of the [contract provision] in this case." Appx234. Based on the evidence presented at trial concerning the economic and technical comparability of the agreements (Appx3333-3335; Appx3432-3434; Appx3504), the district court properly found that "Defendants' challenges properly went to the weight, not admissibility, of the agreements" (Appx235).

First, the district court properly rejected Defendants' argument (Blue Br. 56, 59) that the Hughes and CSIRO licenses should have been excluded because they state they "[contract provision]," finding it unsupported by any rule of evidence or case law. Appx234-235.

Second, contrary to Defendants' arguments (Blue Br. 57, 59-60), the damages testimony is consistent with the apportionment requirement. This Court has held that apportionment of value of the patented technology to the end product is automatically accounted for where a royalty is based on comparable licenses and licensing negotiations. *CSIRO*, 809 F.3d at 1302-04; *see also Elbit*, 927 F.3d at 1301. And contrary to Defendants' argument, substantial evidence supports the

economic and technical comparability of the Hughes and CSIRO licenses. Appx3333-3337; Appx3432-3440; Appx3472-3483; Appx3504-3505. Defendants introduced no contrary expert damages testimony, and the jury was free to weigh any differences Defendants sought to show through cross-examination. Appx234. The district court also found many of Defendants' license comparability arguments waived. Appx230-231.

Third, Defendants err in contending (Blue Br. 58-60) that Dr. Teece's adjustments to the royalty rates from the comparable licenses were not supported by substantial evidence. As noted above, Dr. Teece began with the [number] and $1.13 per unit imputed royalty rates from the CSIRO and Hughes licenses and modified them to account for their differences from the hypothetical negotiation. Those differences included the presumption of infringement and validity during the hypothetical negotiation, the importance of the technology to Wi-Fi and of Wi-Fi to Apple's businesses, Apple's need to rely on the best Wi-Fi technology to maintain a competitive advantage, the technological advantages of the inventions, evidence that the Caltech patents were more technologically important than the patents in the CSIRO license, the increase in Broadcom chip prices and profit margins at the time of the hypothetical negotiation, and the absence of non-infringing alternatives. Appx217-218; Appx3432-3440; Appx3473-3483. Based on those factors, Dr. Teece opined that a reasonable royalty was $1.40 per device

for Apple and $0.26 per chip for Broadcom. Again, Defendants did not offer any contrary expert damages testimony from which the jury could reasonably conclude that the rates should be adjusted any differently.

Defendants further err in contending (Blue Br. 59-60) that it was error to admit this testimony because Dr. Teece did not employ a mathematical formula to calculate his adjustments to the imputed royalty rates from the comparable licenses. "This [C]ourt has recognized that estimating a reasonable royalty is not an exact science," *Summit 6, LLC v. Samsung Elecs. Co., Ltd.,* 802 F.3d 1283, 1296 (Fed. Cir. 2015), and the weighing of the *Georgia-Pacific* factors allows an expert to use his or her judgment, *Georgia-Pacific,* 318 F. Supp. at 1120-21 ("[T]here is no formula by which these factors can be rated precisely in the order of their relative importance or by which their economic significance can be automatically transduced into their pecuniary equivalent."). Defendants rely on *Finjan, Inc., v. Blue Coat Systems, Inc.,* 879 F.3d 1299 (Fed. Cir. 2018), but that case imposes no "mathematical formula" for weighing *Georgia-Pacific* factors. Instead, in *Finjan* damages were "plucked from thin air" by the plaintiff's Vice President who testified to a royalty rate that lacked any support in the record. *Id.* at 1311-12. Here, to the contrary, the expert properly derived royalty rates from

comparable licenses and then adjusted the rates to account for differences between

the hypothetical negotiation and the comparable licenses.[4]

C.   The District Court Properly Excluded Defendants' Damages Opinions

Defendants' skeletal argument (Blue Br. 61-63) that their experts' testimony

was improperly excluded is too conclusory to preserve the issue for appeal. *See*

Game and Tech. Co., Ltd. v. Wargaming Group Ltd., 942 F.3d 1343, 1350 (Fed.

Cir. 2019); *Trading Techs. Int'l, Inc. v. IBG LLC*, 921 F.3d 1378, 1385 (Fed. Cir.

2019); *Nixon v. City and County of Denver*, 784 F.3d 1364, 1366 (10th Cir. 2015)

(argument waived where "the reasons that were given by the district court go

unchallenged").

Even if not waived, none of Defendants' three arguments shows any abuse

of discretion. *First*, contrary to Defendants' argument (Blue Br. 61), the district

court properly excluded Dr. Stark's opinion "comparing the accused technology to

other features in Defendants' chips." The district court held that the expert cannot

"tout[] some benefit a feature can provide and then conclude[] the feature is more

important than LDPC simply because LDPC cannot provide that same benefit" and

that "it is nonsensical to opine that a feature is more important than LDPC simply

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[4]   Defendants argue (Blue Br. 58) that Dr. Teece was required to make a downward adjustment because the Hughes license settled litigation, but the district court deemed this argument waived (Appx230-231), and Defendants do not challenge that ruling.

because LDPC does not have anything to do with that feature." Appx143; *see also* Appx152-154. Defendants respond only that the expert's report was 67 pages, was "rooted in sound apportionment principles, and would have been important to the jury." Blue Br. 61. But the bare assertion that the expert's report was lengthy, reliable, and useful does not show error.

Second, contrary to Defendants' argument (Blue Br. 61-62), the district court properly excluded Dr. Stark's non-comparable license opinions. Licenses relied upon to prove damages must be "sufficiently comparable to the hypothetical license at issue in suit." *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1325 (Fed. Cir. 2009). "[A]lleging a loose or vague comparability between different technologies or licenses does not suffice." *LaserDynamics*, 694 F.3d at 79. The district court was well within its discretion to exclude the opinions for being

> impermissibly conclusory and failing to meaningfully show that the technology at issue in the identified licensed patents is technologically comparable to the technology at issue in this case. Specifically, Stark does not provide sufficient opinions as to whether the technology is indeed "technologically comparable," as opposed to just being in the same technological field or having similar benefits to those that allegedly flow from the patented technology.

Appx142. On appeal, Defendants assert only that Dr. Stark's analysis was lengthy and "address[ed] the field and benefits of the technology for" representative patents from each license. Blue Br. 62. This conclusory argument does not permit meaningful review, much less show an abuse of discretion.

Third, contrary to Defendants' argument (Blue Br. 62), the district court properly excluded Mr. Thomas's opinions about licenses for standard-essential patents that were not economically comparable. The court excluded this testimony on three grounds, none of which Defendants acknowledge: (1) the opinions lacked foundation because they depended on Dr. Stark's excluded opinions; (2) Mr. Thomas "fail[ed] to adequately account for differences between the asserted patents and his identified 'comparables' from an economic perspective"; and (3) Mr. Thomas did "not adequately show[] that his reliance on damages calculation methodologies that involve SEP/RAND-encumbered patents, including based on royalty stacking opinions and IPXI, Sisvel, and Via Licensing patent pools, are appropriate given the facts of this case." Appx145; *see also* Appx9875-9876. Because Defendants fail to even acknowledge the district court's three grounds, they have not shown an abuse of discretion.

> **D.   The Damages Award Is Not Based On Extraterritorial Sales**
>
> **1.   The Expert Damages Testimony Supports A Finding That All Sales Were U.S.-Based**

Section 271(a) provides in relevant part that "whoever without authority makes, uses, offers to sell, or sells any patented invention, *within the United States* ... infringes the patent" (emphasis added). "The standards for determining where a sale may be said to occur do not pinpoint a single, universally applicable fact that determines the answer." *Carnegie Mellon Univ. v. Marvell Tech. Group, Ltd.*, 807

F.3d 1283, 1308 (Fed. Cir. 2015). "Places of seeming relevance include a place of inking the legal commitment to buy and sell and a place of delivery . . . and perhaps also where other 'substantial activities of the sales transactions' occurred." *Id.* (quoting *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 769 F.3d 1371, 1379 (Fed. Cir. 2014), *vacated on other grounds*, 136 S. Ct. 1923).

The record here amply satisfies these extraterritoriality standards. The jury heard evidence that virtually every aspect of Defendants' sales cycle occurred in the United States. Appx3275-3301. Thus, contrary to Defendants' suggestion (Blue Br. 63-64), this case does not implicate the problem that arises "when substantial activities of a sales transaction, including the final formation of a contract for sale encompassing all essential terms as well as the delivery and performance under that sales contract, occur entirely outside the United States," *Halo Electronics, Inc. v. Pulse Electronics, Inc.*, 831 F.3d 1369, 1379 (Fed. Cir. 2016).

First, the MDSAs between Broadcom and Apple that govern development and supply of the infringing chips were negotiated and signed in the United States. Appx3279-3280; Appx10443; Appx10452; Appx10479-10481.

Second, pursuant to the MDSAs, Apple sent Broadcom **[contract provision]** in the United States indicating the number of chips Apple would purchase and the date of delivery. Appx3290; Appx10439-10440; Appx10443-

10445. Sending a [contract provision] contractually obligated Broadcom to provide chips to meet those [contract provision] and Apple to compensate Broadcom. Appx3290-3291; Appx3296-3297; Appx6076-6077; Appx10439-10446; Appx10451-10452; Appx10454-10456; Appx10481-10482. The prices were governed by the terms of the MDSAs, and Broadcom and Apple negotiated the prices in the United States. Appx10452. Defendants called no witness to rebut this evidence.

Defendants fail in arguing (Blue Br. 63-64) that certain sales happened outside of the United States because they were made pursuant to purchase orders sent to Broadcom by Apple's foreign suppliers and those purchase orders contained price terms. The MDSA and [contract provision] create binding commitments to buy and sell irrespective of the purchase orders. Broadcom reviewed and approved the purchase orders in the United States. Appx3277-3278; Appx3295; Appx3301. Finally, the purchase orders contained [contract provision] because Broadcom did not want other customers to know the [contract provision] it agreed to with Apple, and Broadcom later [contract provision] the difference between the [contract provision] and the previously agreed price to by Apple in the United States. Appx3297-3298; Appx3301; Appx10453-10454; Appx10483.

Third, the evidence of Broadcom's "design wins" with Apple in the United States further demonstrate that the infringement was U.S.-based. Appx3280-3288. A "design win" is the "culmination of a long sale cycle for custom or customized

semiconductor chip products in which the end customer and the chip supplier negotiate and agree to pricing based on estimated volumes." Appx3281. *Carnegie Mellon University* held, for example, that the evidence might support a finding of U.S. sales on remand if sales of the infringing products were the result of a lengthy sales cycle involving a "design win" within the United States to produce customized chips. 807 F.3d at 1309; *see Broadcom Corp. v. Emulex Corp.*, 732 F.3d 1325, 1336-37 (Fed. Cir. 2013) (observing that Broadcom competes in a market where "design wins" are the relevant sales).

The record here contains just such evidence. When Broadcom achieves a "design win," it describes it as "having closed the deal" and pays its sales staff commissions. Appx3281; Appx3284. The result of a design win is hundreds of millions of chip sales. Appx3282. Broadcom's "design wins" with Apple are the result of a lengthy sales cycle involving joint work in the United States over several years so that Broadcom can design [contract provision] chips for Apple's products. Appx3287-3290; Appx10470; Appx10475-10479. Broadcom refers to Apple "design wins" as sales in the United States and compensates its sales team based on design-win revenue. Appx3282-3286; Appx3299-3300.

Based on all this evidence, the jury could reasonably have found that the relevant sales occurred within the United States. *WesternGeco LLC v. ION Geophysical Corp.*, 138 S.Ct. 2129 (2018), further supports this conclusion. That

decision, which permitted recovery of foreign lost profits under § 271(f), suggests that the presumption against extraterritoriality never enters play, even if other activities happen abroad, so long as an infringement inquiry (as here) focuses on U.S. conduct. *Id.* at 2137-38.

2. The Territoriality Jury Instruction Was Correct

Contrary to Defendants' suggestion (Blue Br. 66), there was no error in the instruction that "[t]he United States sales cycle leading to design wins could also trigger United States sales" (Appx184). As discussed, the instruction is well supported by *Carnegie Mellon*, where this Court opined that a "substantial level of sales activity" within the U.S., including a U.S.-based sales cycle leading to "design wins," could permit a jury to find that sales happened in the United States. 807 F.3d at 1309-10.

Nor did the court err, as Defendants wrongly suggest (Blue Br. 65), by declining to give their preferred instruction that "there is a presumption against applying United States patent laws to foreign activities." Appx10538. To begin with, this is not an evidentiary presumption that a jury applies, but rather a legal presumption that comes into play when courts are interpreting federal laws. *See WesternGeco*, 138 S.Ct. at 2136-37 (describing legal test for interpreting federal statutes to determine when presumption is overcome). Moreover, "[t]his Court reviews jury instructions in their entirety and 'only orders a new trial when errors

in the instructions as a whole clearly mislead the jury.'" *DSU Med. Corp. v. JMS Co., Ltd.*, 471 F.3d 1293, 1304 (Fed. Cir. 2006) (en banc) (quoting *Chiron Corp. v. Genentech, Inc.*, 363 F.3d 1247, 1258 (Fed. Cir. 2004)).

There is no error in the territoriality instruction under this standard. As the district court noted, Defendants' request was not supported by any model instruction (Appx4341), and Defendants cite no instance of such an instruction being given. The court correctly instructed the jury that Caltech had the burden of proving infringement occurred within the United States and provided thorough instruction on what evidence could and could not meet that standard. Appx184-185. The instruction, therefore, informed the jury of what was necessary to find U.S.-based infringement and was faithful to the law, particularly after *WesternGeco* explained that the presumption has no application so long as the infringement inquiry looks to U.S. conduct, 138 S.Ct. at 2137-38.[5]

Nor was any alleged error in the instruction prejudicial. Nothing in the record suggests the jury was confused, Defendants do not even argue lack of harmlessness, and the evidence of U.S. sales in this case was extensive and largely undisputed.

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[5]   This case is thus a far cry from *Carnegie Mellon*, which vacated and remanded because of plain error in an instruction that, unlike here, failed to require the jury "to find a domestic location of sale as to those chips not made or used in, or imported into, the United States." 807 F.3d at 1310.

E.   Partial Reversal On Liability Would Not Warrant A New Damages Trial

Defendants argue (Blue Br. 66) that if this Court reverses liability on only a subset of the patent claims, it should order a new trial on damages.   That is incorrect.   As the district court noted, Defendants waived this argument by not proposing "patent-by-patent damages questions in the jury verdict" and not presenting a damages theory that differentiated among the asserted claims. Appx200-201; *see McCord v. Maguire*, 873 F.2d 1271, 1274 (9th Cir. 1989) (defendant who did not request special verdict as to each factual theory waives argument that general verdict rests on "unsubstantiated factual theories").

On appeal, Defendants do not dispute that this is a correct application of Ninth Circuit waiver law.   Instead, they argue that the district court should have applied Federal Circuit law.   The argument fails because there is no conflict between the circuits' laws and because even under Defendants' preferred authority, the impact of this Court's judgment should be decided by the district court in the first instance.

First, Defendants fail to show a conflict of laws.   They cite no decision from this Court holding that a defendant cannot waive a request for a new damages trial. Even the cases Defendants cite note that a defendant may waive a new damages trial by failing to object to a general damages verdict form.   *VirnetX Inc. v. Apple Inc.*, 6:12cv855, 2020 WL 3635929, at *6 (E.D. Tex. Apr. 23, 2020).   Defendants

did not object to the verdict form and argued for a single lump sum damages amount for all patents. Appx4501-4502.

Second, even if there were a true conflict, Defendants have not shown that this Circuit's law governs. Regional circuit law applies to new trial motions, as Defendants acknowledge. Blue Br. 29. Similarly, whether a right to a new trial can be waived where liability is partially reversed or vacated arises in many non-patent contexts and is not unique to patent law. *See, e.g., McCord*, 873 F.2d at 1274. This Court has, therefore, applied the same Ninth Circuit law and held that the right to a new trial under these circumstances is waived where the movant did not object to a general verdict. *Mitsubishi Elec. Corp. v. Ampex Corp.*, 190 F.3d 1300, 1304 (Fed. Cir. 1999) (applying the Ninth Circuit's *McCord* waiver rule).

Third, even if Defendants were correct, the appropriate course would be to remand for the district court to consider the impact of this Court's judgment on the verdict in the first instance, as Defendants' cited cases hold. *DDR Holdings*, 773 F.3d at 1262 ("We remand to the district court to determine the effect—if any—of our invalidation of the '572 patent on the jury's damages award."); *Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1310 (Fed. Cir. 2007) ("We think it is best under these circumstances to remand this issue for consideration by the district court in the first instance."). In particular, the district court should decide in the first instance whether "'undisputed evidence' demonstrated that the

sustained patent claim was necessarily infringed by all of the accused activity on which the damages award was based," which would be sufficient to sustain the verdict. *Hologic, Inc. v. Minerva Surgical, Inc.*, 957 F.3d 1256, 1271 (Fed. Cir. 2020).

CONCLUSION

This judgment should be affirmed.

DATED: March 19, 2021   QUINN EMANUEL URQUHART &
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CERTIFICATE OF SERVICE

I, Kathleen M. Sullivan, hereby certify that on March 19, 2021, I will cause to be served, via this Court's ECF system, the foregoing [corrected] non-confidential Brief of Appellee The California Institute of Technology:

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CERTIFICATE OF COMPLIANCE

Pursuant to Federal Rule of Appellate Procedure 32(a)(7)(C), the undersigned certifies that this brief complies with the type-volume limitations of Federal Rule of Appellate Procedure 32(a)(7)(B).

1.   Exclusive of the exempted portions of the brief, as provided in Fed. R. App. P. 32(a)(7)(B)(iii) and Federal Circuit Rule 32(b), this brief includes 13,807 words.

2.   This brief has been prepared in proportionally spaced typeface using Microsoft Word 2013 in 14 point Times New Roman font. As permitted by Fed. R. App. P. 32(a)(7)(C), the undersigned has relied upon the word count of this word-processing system in preparing this certification.

Dated: March 19, 2021   */s/ Kathleen M. Sullivan*
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