IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

CARNEGIE MELLON UNIVERSITY, Plaintiff, v. MARVELL TECHNOLOGY GROUP, LTD. and MARVELL SEMICONDUCTOR, INC., Defendants.	Civil Action No. 2:09-cv-00290-NBF Hon. Nora B. Fischer

MARVELL'S [CORRECTED] MEMORANDUM IN SUPPORT OF MOTION FOR JUDGMENT AS A MATTER OF LAW, NEW TRIAL AND/OR REMITTITUR WITH RESPECT TO DAMAGES

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I. INTRODUCTION

Defendants Marvell Technology Group, Ltd. and Marvell Semiconductor, Inc. (collectively, "Marvell") hereby respectfully move for judgment as a matter of law (JMOL) pursuant to Fed. R. Civ. P. 50(b), renewing and incorporating by reference Marvell's submissions pursuant to Fed. R. Civ. P. 50(a) (Dkt. 699-704, 738-743, 747-748), and alternatively for new trial and/or remittitur pursuant to Fed. R. Civ. P. 59(a)(1), on every issue on which Plaintiff Carnegie Mellon University ("CMU") prevailed at jury trial. This memorandum supports the motion with respect to damages.[1]

This is the rare case involving a patent damages verdict exceeding $1 billion. Few if any such verdicts have ever survived post-trial motions and appeal. The damages verdict here for $1,169,140,271 is further unique in that fully $890,734,225.50 to $1,004,491,372 of that jaw-dropping number derives from a royalty base of products never used in the United States. As this Court recognized, it is "novel" (Dkt. 672, at 5) to include extraterritorial use in a royalty base on the theory that such use is traceable to U.S.-based infringement. Such a novel theory raises serious questions for appeal. But this Court can cabin the potentially far-ranging reach of that theory and limit exposure to reversal on appeal by entering JMOL or remitting the damages here so as to limit damages to the domestic royalty base.

The Court should further grant JMOL or new trial and/or remittitur on the ground that the record fails to support the royalty rate of $.50/chip on which the jury premised its damages award. The testimony of CMU's damages expert Catharine Lawton gave no basis for a royalty rate hundreds of times greater than any actual licensing agreement or even CMU's "highly

[1] Marvell is filing a separate memorandum in support of judgment as a matter of law and/or new trial on issues other than damages. Marvell here assumes infringement and validity *arguendo* but fully preserves its objections to the jury's findings on both issues.

speculative" projection of its best-case licensing scenario (DX-272; DX-299). Ms. Lawton's "excess profits" theory was divorced from the patented method, her "price premium" theory rested on an unrepresentative sample of chips sold to one of Marvell's smallest customers, and she failed to properly apportion the infringing algorithm in relation to other valuable components of Marvell's chips.

II. LEGAL STANDARDS

This Court may grant JMOL after jury verdict under Fed. R. Civ. P. 50(b) where the verdict does not rest on a legally sufficient evidentiary basis. *Galena v. Leone,* 638 F.3d 186, 196 (3d Cir. 2011). "To succeed on a renewed motion for JMOL following a jury trial and verdict, the movant 'must show that the jury's findings, presumed or express, are not supported by substantial evidence or, if they were, that the legal conclusion(s) implied [by] the jury's verdict cannot in law be supported by those findings.'" *Comaper Corp. v. Antec, Inc.*, 867 F. Supp. 2d 663, 667 (E.D. Pa. 2012) (*quoting Pannu v. Iolab Corp.*, 155 F.3d 1344, 1348 (Fed. Cir. 1998)).

This Court may grant new trial under Fed. R. Civ. P. 59(a)(1) where the verdict is "against the weight of the evidence," *see Maylie v. Nat'l R.R. Passenger Corp.*, 791 F. Supp. 477, 480 (E.D. Pa. 1992), *aff'd without opinion*, 983 F.2d 1051 (3d Cir. 1992); *Wilburn v. Maritrans GP Inc.*, 139 F.3d 350, 363 (3d Cir. 1998), including as to the size of damages, *see Whitserve, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 26 (Fed. Cir. 2012); *Wordtech Sys., Inc. v. Integrated Networks Solutions, Inc.*, 609 F.3d 1308, 1319-20 (Fed. Cir. 2010). A new trial may also be granted under Fed. R. Civ. P. 59(a)(1) for prejudicial legal error. *Maylie*, 791 F. Supp. at 480; *Dressler v. Busch Entm't Corp.*, 143 F.3d 778, 780 (3d Cir. 1998). This Court has discretion to grant remittitur as an alternative to new trial where the damages "decision of the jury is clearly unsupported and/or excessive." *Cortez v. Trans Union, LLC*, 617 F.3d 688, 715-

16 (3d Cir. 2010) (*quoting Spence v. Bd. of Educ. of Christina Sch. Dist.*, 806 F.2d 1198, 1201 (3d Cir. 1986)).

III. MARVELL IS ENTITLED TO JMOL WITH RESPECT TO DAMAGES

It is mathematically certain that the jury's damages award of $1,169,140,271 (12/26/12 Tr. at 18:17-22) represents a $.50/chip royalty on 2,338,280,542 chips, the royalty rate and royalty base to which CMU's damages expert Ms. Lawton testified. (12/10/12 Tr. (Lawton) at 171:1-19 (as to royalty rate); 12/7/12 Tr. (Lawton) at 64:20-65:7 (as to number of chips).) It is also mathematically certain that the overwhelming majority of those chips were never used in the United States; CMU's damages expert Ms. Lawton estimated the total number of U.S. chips at either 556,812,091 or 329,297,798. (12/10/12 Tr. (Lawton) at 165:6-166:2 (as to 556,812,091 chips); 208:1-24 (as to the dollar figure that results from multiplying a $.50 royalty by 329,297,798 chips); 199:21-200:4.)[2] Had damages been assessed at a rate of $.50 only upon accused U.S. chips, the award would have been no greater than $278,406,045 or $164,648,899, each a small fraction of the $1.17 billion the jury awarded. (12/10/12 Tr. (Lawton) at 200:19-22 (as to "$278.4 million"); 208:22-24 (as to $164,648,899).)

This Court should grant JMOL so as to exclude chips used outside the United States from the royalty base. As the Court correctly recognized at summary judgment, CMU may not recover infringement damages in a U.S. court under 35 U.S.C. §§ 271(a), (b), or (c) for "direct or indirect infringement of any method claims of U.S. Patent Nos. 6,201,839 and 6,438,180 in connection with sales of chips that are never used in the United States." (Dkt. 441, at 14.) The Court permitted evidence of foreign chip sales at trial based only upon a "novel" theory—

[2] Marvell preserves its objection to the failure to particularize the verdict form to specify the relative foreign and domestic amounts. (12/20/12 Tr. at 38:2-8; Decl. of Joseph Milowic III, Exhs. A, B, C (12/18/12 Email Submitting Proposed Verdict Forms; CMU's Proposed Verdict Slip; Marvell's Proposed Verdict Slip).)

namely, that U.S. patent law might encompass purchases of chips for use outside the United States where chips were purchased ***only*** because of the patented method, in the sense that the patented technology was ***driving*** sales to customers. (Dkt. 672, at 5-6 ("sales which arise ***only*** due to infringement") (emphasis in original); *id.* at 6 n.13 ("evidence of the usage of the patented technology to ***drive*** certain sales") (emphasis added).)

Marvell respectfully reiterates its submission (Dkt. 356-359, 414-415, 440, 656-657, 663) that this theory is foreclosed as a matter of law. *E.g.*, *Microsoft Corp. v. AT&T Corp.*, 550 U.S. 437, 442, 444, 455-58 (2007) (construing U.S. patent statutes narrowly in order to avoid any "extraterritorial effect" or "extraterritorial thrust" in light of "the presumption against extraterritoriality"); *Deepsouth Packing Co. v. Laitram Corp.*, 406 U.S. 518, 531, 532 (1972) (finding that "limitations on [an issued patent's] exercise are equally strictly enforced," "insist[ing] on a clear congressional indication of intent to extend the patent privilege" before "approving the position of a litigant" who seeks to "expand patent rights," and holding that the U.S. patent system "makes no claim to extraterritorial effect"); *Brown v. Duchesne*, 60 U.S. 183, 195 (1856) (finding that Congress did not intend the U.S. patent laws to "operate beyond the limits of the United States"); *Pellegrini v. Analog Devices, Inc.*, 375 F.3d 1113, 1118 (Fed. Cir. 2004) (with respect to patent claims directed to devices, finding that "chips" that "are not made in, used in, sold in, offered for sale in, or imported into the United States"—*i.e.*, chips that are not infringing—are "outside of the reach of U.S. patent laws"). But even assuming this novel theory might otherwise be available to CMU, the record at trial did not support it.

Marvell is accordingly entitled to JMOL that the appropriate royalty base is at most **556,812,091** or **329,297,798** chips, leaving CMU entitled to a reduction of damages to a maximum of **$278,406,045.5** or **$164,648,899** respectively. Alternatively, this Court should

grant new trial conditioned on rejection of a remittitur to a damages award no greater than those amounts, both because the weight of the evidence failed to support the verdict and because the Court's jury instruction failed to impose a sufficiently strict causal nexus to domestic conduct.

Moreover, this Court should grant JMOL to Marvell on the ground that the evidence was insufficient for any rational jury to find a royalty rate of $.50/chip. Neither the "excess profits" nor the "operating profit premium" analysis bore any rational relationship to the value of the patented method in relation to other features of Marvell's products, and there was no proof that CMU and Marvell would have entered any hypothetical license other than for a lump sum. Alternatively, this Court should grant a new trial conditioned on rejection of a remittitur to damages based on a $.03/chip royalty rate, yielding damages no greater than **$70,148,416** (if the base is 2,338,280,542 chips), **$16,704,363** (if the base is 556,812,091 chips), or **$9,878,934** (if the base is 329,297,798 chips), or a remittitur based on a flat royalty rate of **$400,000** (based on $200,000 per patent) or **$20 million** (based on 10 years of annual payments of $2 million).

A. Marvell Is Entitled To JMOL Excluding Chips Never Used In The United States From The Royalty Base

This Court held before trial that CMU could include foreign chips in the royalty base if customers purchased those chips outside the United States "***only*** due to infringement," based on "evidence of the usage of the patented technology to ***drive*** certain sales." (Dkt. 672, at 5-6 (emphasis in original); 6 n.13 (emphasis added).) Setting aside the legal error in CMU's theory, the evidence at trial failed to meet this stringent causal-nexus requirement, and in fact fails to provide a basis from which a reasonable jury could conclude that ***any*** customer bought ***any*** non-U.S. chips from Marvell ***only*** because of the patented method.

1. The Record Fails To Show That Any Customer Purchased Any Chip From Marvell Only Because Of The Patented Method

CMU did not subpoena any of Marvell's customers to appear at trial. Nor did CMU play for the jury any videotaped deposition testimony of a Marvell customer explaining why it had purchased any particular chip from Marvell at any particular time. Although CMU did offer the testimony of three expert witnesses, none of those experts knew or had investigated the reasons why hard-disk drive makers purchased chips from Marvell. Dr. Bajorek, CMU's "expert on the hard disk drive industry and the sales cycle" (Dkt. 713, at 5), was the only CMU witness potentially qualified to offer such testimony.[3] But Dr. Bajorek stated that he had no opinion regarding whether any of Marvell's customers considered the patented method "must have" technology. (12/4/12 Tr. at 212:20-213:14.) When asked whether the patented method was "must have" for Western Digital, Toshiba, Fujitsu, or Hitachi (most of Marvell's largest customers), he answered "I don't know" (*id.* at 213:4-14), admitting that he "didn't study the status of their technology" and did not know "which other chips they had at their disposal" (*id.* at 213:6-9).

Moreover, the evidence affirmatively demonstrates that customers purchased chips ***despite*** the patented method, not because of it. Dr. Bajorek acknowledged that Western Digital, Marvell's largest customer, wanted to "pull the MNP out of the Marvell chips" that it was using

[3] Dr. McLaughlin, CMU's "expert on infringement" (Dkt. 713, at 5), did not offer any opinions regarding Marvell's sales, the sales cycle, or customer purchasing decisions. And Ms. Lawton disavowed expertise in any "technical matters concerning Marvell's business, the semiconductor industry [or] the market for computer chips and the patented technology," and she was accordingly precluded from "express[ing] her own opinions on these matters." (*Id.* at 25; *see also* 12/7/12 Tr. at 20:20-21:2.) More specifically, she had no expertise that would qualify her to offer any opinions regarding how a hard drive manufacturer would "decide between Chip A and Chip B," the very inquiry relevant here. (12/6/12 Tr. at 123:19-25.)

for a "particular drive program" called "La Jolla." (*Id.* at 205:5-19.)[4] And Mr. Iftikhar Baqai, a Western Digital employee who was responsible for Western Digital's technical evaluation of chips and selection of chip suppliers from 1997 to 2005, testified that the circuits accused of performing the patented method—the media noise processor (MNP) and non-linear viterbi/non-linear detector (NLV/NLD)—played ***no*** role in Western Digital's decision to purchase Marvell chips. (12/13/12 Tr. at 146:14-147:2, 151:2-7, 156:7-21, 158:24-159:8, 164:21-25.)

Specifically, Mr. Baqai testified that neither the MNP nor the NLV was "a factor of any weight in Western Digital's decision to make Marvell the exclusive supplier of read channel chips"; that the MNP was not "ever a factor of any weight in [his] decision to procure read channel chips from Marvell"; and that neither the MNP nor the NLV/NLD was "a factor at all in the sales from Marvell to Western Digital during the time that [Mr. Baqai was] responsible" for evaluating chip suppliers. (*Id.* at 156:7-21, 159:3-8, 164:21-25.) Mr. Baqai further testified that the circuits accused of performing the patented method had zero value: "We did not see any improvement as a result of that feature"; "as a result of this MNP feature, we did not see any performance gain"; "the gain as displayed [by the MNP] is virtually nothing"; "this feature was no good, and it didn't do anything for me"; "this particular feature did not add any value in terms of SNR gain for us"; "MNP did not provide any benefits in terms of its SNR performance to us"; "it was of no use." (*Id.* at 160:3-13, 161:18-162:7, 163:3-20, 173:23-174:3, 176:18-25; *see also* DX-1559, DX-1560.) Indeed, Mr. Baqai testified that "I specifically requested Marvell to ***remove*** MNP feature out of our read channel devices that they were providing us, so obviously

[4] La Jolla was the third drive program for which Western Digital purchased accused chips and the ninth largest program out of the 44 programs for which any customer purchased accused chips. (P-Demo 20.)

to me because the feature did not offer any—any tangible benefit." (*Id.* at 177:9-22 (emphasis added); *see also id.* at 163:16-20.)

The record supports Mr. Baqai's testimony. (*E.g.*, DX-210 (Marvell employees discussing Western Digital's request to "[r]emove MNP because WD is not seeing enough gain to justify 1.5mm2 (or if we want to eat the cost of the die and not remove it that's fine too)"); DX-218 (Marvell employees discussing "an accurate assessment of design risk and schedule impact on pulling the MNP from the core," noting that "[a]t a die size of ~1 mm 2, the benefit can not [sic] be justified"); DX-419 (Western Digital notation that MNP was "Not Needed" for its La Jolla drive program); (8/13/10 Dep. Of Mr. Brennan, Marvell's Vice President of Sales, at 225:9-13); (8/19/10 Dep. Of Dr. Doan, Marvell's Vice President of Read Channel Development, at 179:15-19, 180:12-13, 180:15-21).) In the face of this evidence, a reasonable jury could not find that Western Digital purchased chips from Marvell only because of the use of the patented method or that the patented method drove Marvell's sales to Western Digital.

Nor could a rational jury find differently for any other Marvell customer. Mr. O'Dell, the Worldwide Director of Field Applications Engineering at Marvell, testified that "several of the customers reacted very negatively to the MNP"; that "we were requested to remove it by several customers"; and that Marvell never won any sale to any customer "because of the MNP or NLD." (12/17/12 Tr. at 223:5-8, 224:20-22, 225:7-8, 225:13-16, 228:17, 228:21.) Mr. Brennan, Marvell's Vice President of Sales, testified that he "had several discussions with customers that did not want to pay for the MNP." (Brennan Dep. at 128:16-17.) He elaborated: "[A]t the time we deliver it, boom, you know, 'It's blowing our power budget in mobile, I'm not seeing the gain, I don't want to pay for it in desktop,' [which was] the most sensitive, you know, cost market at the time." (*Id.* at 128:16-25.) The documentary record again corroborates all of this

testimony. (*E.g.*, P-897 (Fujitsu characterizing the performance of the MNP as "unfortunate" and "discouraging"); DX-1141 (reporting concerns about the MNP from Toshiba and Hitachi).)

There was also undisputed testimony that Marvell customers look to a variety of factors when purchasing chips—and that the mix of factors considered varies by customer (*e.g.*, 12/13/12 Tr. at 154:16-155:3) and even by drive program (*e.g.*, 12/4/12 Tr. at 179:18-20, 180:14-15). Marvell's Vice President of Marketing Dr. Armstrong, Marvell's Vice President of Sales Mr. Brennan, and Marvell's Worldwide Director of Field Application Engineering Mr. O'Dell each testified that myriad considerations contribute to Marvell's sales of chips. (Armstrong 30(b)(6) Dep. at 28:6-31:9, 244:4-245:6, 448:2-449:8; Brennan Dep. at 88:19-89:24; 12/17/12 Tr. (O'Dell) at 223:9-22.) Mr. Baqai testified that Western Digital considered various technical features when selecting Marvell as its chip supplier. (12/13/12 Tr. at 154:16-155:3.) And Dr. Bajorek, CMU's own expert on the hard disk drive industry, agreed that there are several "key factors that Marvell's customers consider to be vital when purchasing chips." (12/4/12 at 178:21-24, 179:18-180:3, 180:8-15, 182:8-183:12.) This evidence underscores the absence of any evidence that Marvell sold any chips only because of the patented method.

2. The Record Fails To Support Inclusion Of Chips Never Used In The United States In The Royalty Base

Because the evidence failed to show causal nexus between use of the patented method and purchases of Marvell's chips, it therefore failed to support the inclusion of non-U.S. chips in the royalty base by virtue of a supposed causal nexus to U.S.-based infringement. This Court accordingly should grant JMOL excluding from the royalty base all non-U.S. chips and limiting that base to the only numbers in the record that can support chip use in the United States. CMU damages expert Ms. Lawton testified to two possible numbers for chips used in the United States: **556,812,091** and **329,297,798**.

Ms. Lawton's premised her estimate of a base of **556,812,091** U.S. chips (12/10/12 Tr. at 165:6-166:2) on "industry analyst data regarding the number of PC's that are imported into the United States, as the number of PC's imported to the United States, as the vast majority of the hard drives that end up in the United States." (*Id.* at 164:25-165:5.) That single, conclusory statement, however, is insufficient to support a rational jury finding that the number of chips used in the United States is 556,812,091. Ms. Lawton has no expertise in Marvell's business, the semiconductor industry, or the markets relevant to this case. (Dkt. 713, at 25.) Nor did Ms. Lawton explain how she extrapolated the number of ***Marvell*** chips imported into the United States from the ***total*** "number of PC's that are imported into the United States." And CMU offered no documentary evidence or other expert testimony to support Ms. Lawton's determination of a royalty base totaling **556,812,091** chips. But even if testimony as to this amount were accepted, it would yield a damages amount of at most **$278,406,045** if a $.50/chip royalty rate were applied, and Marvell should be granted JMOL to at most that damages amount.

On cross-examination, Ms. Lawton testified that she calculated an alternative U.S. royalty base of **329,297,798** chips using actual import data provided by Marvell's customers. (12/10/12 Tr. at 208:1-7; 208:22-24.) Accepting Ms. Lawton's representation that she calculated this amount from relevant raw data (which would not require any technical expertise), a rational jury might find that the number of chips used in the United States is **329,297,798**, in which case Marvell should be granted JMOL for damages of at most **$164,648,899** if a $.50/chip royalty rate were applied. (12/10/12 Tr. at 208:9-24, referencing Lawton Report, Table 15, Schedule 54.)

B. Marvell Is Entitled To JMOL Rejecting A $.50/Chip Running Royalty Rate

In addition to failing to support the 2,338,280,542-chip royalty base underlying the $1.17 billion jury award, the record fails to support that award's $.50/chip royalty rate. Ms. Lawton herself acknowledged that such a rate might well force Marvell to shut down its business, in

which case Marvell would never have agreed to such a rate in any hypothetical negotiation. (12/10/12 Tr. at 259:12-24 (Lawton testimony that a rate greater than $.42/chip would leave Marvell without an "adequate return" to make its business worthwhile).) And a $.50 per-unit rate fails to reflect record evidence that chip pricing varies by chip as well as by customer. The $0.50 per-unit rate also fails to recognize that there are many important technologies used on the chip, not just the allegedly infringing feature. Accordingly, Marvell is entitled to JMOL that the evidence is legally insufficient to support a $.50/chip running royalty rate.

Ms. Lawton invoked two "benchmarks" in opining in favor of a $.50/chip royalty rate: (1) $.42 resulting from a so-called "excess profits" analysis; and (2) $.72 resulting from a so-called "operating profit premium" analysis. (12/10/12 Tr. at 108:1-9.) But it is well-established that royalty rates must express the value of the patented technology or method, *see Riles v. Shell Exploration & Prod. Co.*, 298 F.3d 1302, 1311, 1312, 1314 (Fed. Cir. 2002) (vacating damages award where none of plaintiff's "three economic models" constituted "adequate evidence to support the verdict" because none valued the patented method); *Laserdynamics, Inc. v. Quanta Comp., Inc.*, 694 F.3d 51, 66-70, 81 (Fed. Cir. 2012)(vacating damages award where royalty rate applied by jury was "untethered from the patented technology at issue" and thus "arbitrary and speculative"); *cf. Apple, Inc. v. Motorola, Inc.*, No. 1:11-cv-08540, 2012 WL 1959560, *7-9 (N.D. Ill. May 22, 2012) (Posner, C.J., sitting by designation) (excluding expert testimony that "fails to isolate the value" of the patented feature), and must account for non-infringing alternatives, *see Riles*, 298 F.3d at 1312; *Brandeis Univ. v. Keebler Co.*, No. 1:12-cv-01508, at 10 (N.D. Ill. Jan. 18, 2013) (Posner, C.J., sitting by designation) (finding that failure to consider non-infringing alternatives rendered unreliable a proposed methodology for calculating

reasonable royalty) (Ex. A to Memo); *Apple*, No. 1:11-cv-08540, 2012 WL 1959560 at *7-8, *11.

Because neither "benchmark" establishes the value of the patented method in relation to other features of Marvell's products or considers non-infringing alternatives, neither furnishes a proper evidentiary basis to support a $.50 running royalty.

1. The "Excess Profits" Analysis Fails To Value the Patented Method

When an accused product includes patented and unpatented features, "'the patentee … must in every case give evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented features, and such evidence must be reliable and tangible, and not conjectural or speculative,' or show that 'the entire value of the whole machine, as a marketable article, is properly and legally attributable to the patented feature.'" *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1318 (Fed. Cir. 2011) (quoting *Garretson v. Clark,* 111 U.S. 120, 121 (1884)); *see id.* at 1313, 1316-18 (invalidating use of 25% rule of thumb as baseline for royalty calculation in place of careful evidence of the specific value of the patented invention); *cf. Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970) (noting under factor 13 that any use of infringer's profits to derive a reasonable royalty must segregate "[t]he portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer"). Because CMU concedes that it cannot satisfy the entire market value rule, it was required to apportion profits between the patented method and the unpatented features in the accused chips in order to determine the value of the patented feature.

Ms. Lawton's "excess profits" is flawed from the start because there is a complete disconnect between "excess profits" and the alleged value of adding the patented technology to

the chips. Ms. Lawton's own analysis shows that Marvell's chips ***without*** the patented technology had ***greater or equal*** "excess profits" than chips ***with*** circuits accused of performing the patented method. (12/10/12 Tr. at 240:19-25; DX-1610). Specifically, Ms. Lawton's chart (DX -1610) shows that the gross margin of all the accused chips is the same or less than the gross margin of all chips. Because inclusion of the patented feature provides no incremental benefit to the gross margins or to the operating margins for the chips, the "excess profits" analysis points to the conclusion that there is no room for any running royalty, much less a $.50 royalty.

Ms. Lawton's "excess profits" analysis also neglects any proper apportionment. Ms. Lawton defined "excess profits" to mean any gross margin over and above Marvell's target gross margin of 50%. (12/10/12 Tr. at 242:7-11.) Thus, if a chip has a gross margin of 51%, "excess profits" would be 1% of revenue; if a chip has a gross margin of 99%, "excess profits" would be 49% of revenue. Ms. Lawton calculated "excess profits" on the accused Systems-on-Chips (SoCs) in this case to be "9.6 percent of revenue" (based on gross margins of 59.6%) or $.42. (*Id.* at 84:8-11, 84:19-85:2.) But even assuming *arguendo* that Ms. Lawton correctly calculated this $.42 figure, it bears no relationship to the value of CMU's patented method, by Ms. Lawton's own admission. (*Id.* at 242:12-17 ("excess profits" are "not necessarily attributable to the patented technology"); *id*. at 259:12-24 ("excess profits analysis goes to the issue of what does Marvell say is adequate profit for its business"); *id.* at 86:5-16.) What Marvell estimates is an "adequate profit" has nothing to do with the value of the patented method relative to other features of Marvell's products.

2. The "Operating Profit Premium" Analysis Fails To Value The Patented Method

Ms. Lawton's "operating profit premium" analysis likewise cannot support a finding that a $.50/chip running royalty values the patented method. That analysis purported to determine the "difference between the sale price of [a] chip that had the MNP minus the price of [a] chip that didn't have the MNP" and to thereby determine the "operating profit premium" that was "associated with the MNP." (12/10/12 Tr. at 87:14-23, 96:17-19.) Ms. Lawton, however, is not an expert in "Marvell's business, the semiconductor industry [or] the market for computer chips and the patented technology" (Dkt. 713, at 25), and admitted that she has no relevant expertise with respect to the pricing of the chips at issue in this case (12/6/12 Tr. at 122:13-18).

Moreover, her calculation relied on far too small and unrepresentative a data set to support a $.50/chip royalty on all 2,338,280,542 chips in the royalty base. Ms. Lawton relies on an alleged $0.72 profit premium for chips sold to Maxtor—Marvell's smallest customer—at a price premium of $1.00 per chip. (12/10/12 Tr. at 93:22-23, 105:1-5, 105:18-19, 243:23-244:7.) Assuming that Ms. Lawton's calculations were correct, however, Maxtor only paid the alleged $1.00 premium for a mere 9885 sample chips—less than 0.0004% of the total number of accused chips.[5] (12/10/12 Tr. at 246:17-247:6). The "premium" analysis thus failed to show that Marvell's biggest customers like Western Digital, Samsung, Fujitsu, Hitachi, or Seagate ever paid any premium for the MNP. (*Id.* at 94:20-22, 244:19-246:10, 257:2-6.) To the contrary, it was clear that the same "premium" analysis, once applied to Toshiba, a much larger, more representative purchaser of the relevant times (purchasing more than 46 times the number that Maxtor did) yielded an alleged profit premium of only ***$.06*** per chip in Ms. Lawton's analysis

[5] Ms. Lawton's analysis shows that Maxtor alleged paid a $0.70 price premium for an additional 137,664 sample chips. (12/10/12 Tr. at 105:1-5). Those sales cannot support the alleged $0.72 profit premium and they amount to about only 0.006% of Marvell's accused sales.

(once again, for a small volume of sample chips only). (D-Demo 11 (CL-11); P-Demo 16 (Table 13); 12/10 Tr. (Lawton) 98:1-18; 12/13 Tr. (Hoffman) 105:7-9.)

Ms. Lawton's extrapolation of global "operating profit premiums" from certain "sample" chips sold to Maxtor alone was further undermined by her testimony regarding price differentials across customers, chips and time. She testified that chip "price will vary by customer." (12/10/12 Tr. 88:6-19; *id.* at 245:7-13 (Western Digital "wanted a price reduction because the MNP was in it"); 12/13/12 Tr. (Baqai) at 181:6-8 (Western Digital was not "willing to pay even one penny per chip"); Brennan Dep. at 128:16-25.) She testified that price "varies from chip to chip" (12/10/12 Tr. at 88:6-19), noting, for example, that "prices on read channels and the profit margins on read channels" were higher during the relevant time period than prices and profits on SoCs, which make up the majority of chips in the royalty base (*id.* at 73:23-74:18). And she testified that price "will vary based on time" (*id.* at 88:6-19), finding, for example, two different "operating profit premiums" paid by Maxtor in two different time frames (*id.* at 103:5-11). For all these reasons, even if a rational jury might credit a $0.72 "premium" with respect to 8995 read channel chips sold to Maxtor in 2002 and 2003, there is no evidentiary basis on which a reasonable jury could conclude that such an analysis supports the same premium with respect to the 99.9996% of the remaining chips in the royalty base over the entire time period at issue. Because Ms. Lawton lacked pricing expertise, she was in no position to connect the price Maxtor paid for the accused chips and the prices that Marvell's large customers were willing to pay based on their valuation of the technology. Given that those larger customers account for over 99% of Marvell's sales in the market, Ms. Lawton's analysis was due to be rejected as "arbitrary, unreliable, and irrelevant," for it did not "carefully tie proof of damages to the claimed invention's footprint in the market place" or otherwise isolate the value of the patented feature

itself. *Uniloc,* 632 F.3d at 1316-18. *See also Brandeis Univ. v. Keebler Co.*, No. 1:12-cv-01508, at 10 (N.D. Ill. Jan. 18, 2013) (Posner, C.J., sitting by designation) (excluding expert testimony where expert provided no basis apart from one analyst's opinion "for assuming that the 2002 to 2005 [market share] trend—a mere three years—would have persisted for seven more years, an assumption essential to her $[#] calculation").

When asked on redirect to explain why she extrapolated as she did, Ms. Lawton answered that the data available "was very, very limited." (12/10/12 Tr. at 257:7-17.) That does not render sound an expert analysis that is so thoroughly unsound, in so many respects. *E.g.*, *Apple*, No. 1:11-cv-08540, 2012 WL 1959560 at *5-6 (rejecting expert analysis where expert had not exhausted "feasible means of dispelling uncertainty" and suggesting that expert "could have conducted a survey" of customers in order to determine the value of the patented feature at issue).[6] Thus, Ms. Lawton's analysis provides no support for any generalized running royalty rate.

And even if a rational jury could extrapolate from such a tiny sample to the larger universe of sales, the "premium" still does not segregate the value of the patented method from other features of the hardware that performs that method. As Ms. Lawton conceded, making a commercially viable circuit to implement the patented method "require[d] effort by Marvell's engineers." (12/10/12 Tr. at 230:20-24.) The inventors themselves recognized that the patented

[6] Here too, Ms. Lawton (or, more appropriately, an expert with the requisite qualifications) could have determined the value of the patented method by collecting data on that subject directly from Marvell's customers via third-party discovery. The testimony offered at trial by a representative of Western Digital—*i.e.*, that the patented method was "of no use" (12/13/12 Tr. (Baqai) at 176:22-25)—supplies ready explanation as to why Ms. Lawton chose not to pursue that method. Even so, such discovery afforded a "feasible means" for determining the value attributable to the patented method if relevant data were not available from Marvell.

method was in an "embryonic" stage of development, that it "exist[ed] in software" only, and that it would "need[] substantial work to bring to market" (*i.e.*, a chip). (P-156.)

Nor was the "operating profit premium" attributable solely to the MNP (*i.e.*, the CMU-patented method plus Marvell-designed hardware). Ms. Lawton testified that the MNP was a "key" or "principal" difference between the chips she compared to arrive at the "premium" (12/10/12 Tr. at 98:19-99:10), but took no account of the value that separate, additional features added above and beyond the MNP. For example, undisputed evidence showed that other distinguishing features like Marvell's "flagship" ten-bit error-correction code, which was introduced into Marvell's chips at the same time as the MNP (12/17/12 Tr. (O'Dell) at 228:17-229:7; 12/4/12 Tr. (Bajorek) at 189:15-18; 12/13/12 Tr. (Baqai) at 178:25-179:14), contributed to the differential. Thus, Ms. Lawton's purported valuation of the "MNP or the NLD" with respect to accused chips sold to Maxtor necessarily "encompass[ed] components not covered by the patent." *Laserdynamics*, 694 F.3d at 70.

3. Neither Analysis Accounts for Non-Infringing Alternatives

"The economic relationship between the patented method and non-infringing alternative methods, of necessity, [] limit[s] the hypothetical negotiation." *Riles*, 298 F.3d at 1312. A failure "to consider the range of plausible alternatives (to licensing [plaintiff's] patents)" is a "fatal defect" that renders a reasonable royalty calculation pure "speculation." *Apple*, No. 1:11-cv-08540, 2012 WL 1959560 at *7-8, *11. Ms. Lawton's testimony reflected such a fatal defect. *First*, she considered only "perfect" alternatives that would enable Marvell "to achieve all the same sales and profits that it did achieve" (12/10/12 Tr. at 210:19-212:1) rather than "the cost, in higher production costs and loss of business to competitors, of the best ***imperfect*** substitute." *Brandeis*, No. 1:12-cv-01508, at 10 (emphasis added). *Second*, she conceded that she made no effort to evaluate the costs of potentially ***perfect*** non-infringing alternatives. (12/10/12 Tr. at

229:15-230:7 ("Marvell could have also licensed some other companies' technology for dealing with media noise.").) Because that burden was not met, Ms. Lawton's analyses cannot support the jury's damages verdict. *E.g.*, *Riles*, 298 F.3d at 1312.

What is more, Ms. Lawton conceded that potential non-infringing alternatives were available but made no effort to evaluate the costs of those alternatives. For example, Ms. Lawton testified that "Marvell could have also licensed some other companies' technology for dealing with media noise," although she did not analyze such alternatives because she "needed more facts." (12/10/12 Tr. at 229:15-230:7.) Ms. Lawton further made no attempt to investigate the costs associated with using alternative technologies for generally improving SNR (whether by addressing media noise or any other kind of noise); notably, CMU's industry expert Dr. Bajorek made clear that these alternatives would substitute for the patented method. (*E.g.*, 12/4/12 Tr. at 77:5-18, 186:14-16, 187:17-19; *see also* 12/13/12 Tr. (Baqai) at 164:18-20, 178:24-179:7.) It was Ms. Lawton's burden (i) to ask appropriately qualified experts to identify non-infringing alternatives (including imperfect ones), (ii) to collect any facts necessary to evaluate the costs of those alternatives, and (iii) to analyze the how such costs would "limit" the hypothetical negotiation. *Riles*, 298 F.3d at 1305; *Brandeis*, No. 1:12-cv-01508, at 8-12 (finding that highly qualified damages expert should have consulted with an expert on consumer demand for the accused products in order to determine the availability of non-infringing alternatives and finding failure to do so rendered reasonable royalty calculation unreliable); *Apple*, No. 1:11-cv-08540, 2012 WL at 1959560, *11 (finding royalty calculation unreliable where expert did not consider that breaking a contract and paying breach of contract damages would be an imperfect alternative to licensing the patent at issue). Because that burden was not met, Ms. Lawton's analysis cannot support the jury's verdict in this case. *E.g.*, *Riles*, 298 F.3d at 1312 (finding that,

"under the constraints of the hypothetical negotiation, the market could not award [the patentee] a royalty for his method divorced of all relation to a potential non-infringing alternative method" and vacating jury award).

4. No Evidence Supports A Running Royalty

The only evidence CMU offered in favor of a running royalty as opposed to lump-sum payment was Ms. Lawton's testimony that, at the time of the hypothetical negotiation, CMU had entered into one running-royalty license agreement and Marvell had entered into three running-royalty license agreements. (12/10/12 Tr. at 112:8-113:21.) But these licenses do not relate to the patents-in-suit, and CMU did not present evidence that these licenses relate to any technology comparable to the patented methods. By contrast, the record contains three "DSSC Agreements" in which CMU issued lump-sum licenses to the patents-in-suit to IBM, Seagate, and 3M. (DX-17, DX-39, DX-40; 12/5/12 Tr. (Wooldridge) at 122:16-123:20.) A fourth agreement in the record is a "Subscription Agreement" providing Intel with an option to license one of the patents-in-suit for a single lump-sum payment of $200,000. (DX-255; 12/5/12 Tr. (Wooldridge) at 180:10-17, 184:2-9.) The inventors here requested that the second of the patents-in-suit be included in the Subscription Agreement on the same terms. (DX-263.) Even CMU's best-case, speculative licensing projection for 2006 and 2007 contemplated a flat, annual rate of $2 million. (DX-272; DX-299.)

Ms. Lawton offered no basis to ignore this lump-sum evidence, noting only that the DSSC Agreements were executed "well before the date of the hypothetical negotiation," "were special," and involved extracontractual collaboration with CMU (12/7/12 Tr. at 136:12-138:5; 12/10/12 Tr. at 188:7-189:4), and that the Intel Subscription Agreement took place "three-and-a-half years after the date of the hypothetical negotiation" (12/7/12 Tr. at 165:17-166:2; 12/10/12 Tr. at 179:23-180:5). Because actual licenses to the patents-in-suit are the most probative

evidence of "the proper form of the royalty structure," they should not have been ignored, providing additional basis for JMOL that CMU is not entitled to a running royalty. *See Laserdynamics*, 694 F.3d at 79-80; *IP Innovation L.L.C. v. Red Hat, Inc.*, 705 F. Supp. 2d 687, 691 (E.D. Tex. 2010) (Rader, C.J., sitting by designation); *Riles*, 298 F.3d at 1313; *Unisplay, S.A. v. Am. Elec. Sign Co., Inc.*, 69 F.3d 512, 519 (Fed. Cir. 1995).

IV. ALTERNATIVELY, THE COURT SHOULD GRANT NEW TRIAL ON DAMAGES AND/OR REMITTITUR

A. Marvell Is Entitled To New Trial Or Remittitur On The Royalty Base

1. The Jury's Award of Royalties On Chips Never Used In the United States Was Against The Weight Of The Evidence

For all the reasons set forth in Part III.A *supr*a, the inclusion of non-U.S. chips in the royalty base was against the weight of the evidence such that, if JMOL is not granted, a new trial is warranted. *See Wordtech*, 609 F.3d at 1319-22; *Whitserve*, 694 F.3d at 26-33.

2. The Jury Instruction Failed To Restrict The Royalty Base To Chips With A Causal Nexus To U.S.-Based Infringing Activity

In allowing CMU to proceed to trial with a "novel" theory of damages derived from foreign chips, this Court made clear that CMU must prove that such chips had been purchased ***only*** because of the patented method, in the sense that the patented technology was ***driving*** sales to customers. (Dkt. 672, at 5-6 ("sales which arise ***only*** due to infringement") (emphasis in original); *id.* at 5-6 & n.13 ("evidence of the usage of the patented technology to ***drive*** certain sales") (emphasis added).) The Court thus sought to prevent the "novel" theory from allowing the improper extraterritorial application of U.S. patent law without proper evidentiary basis. The jury instructions, however, omitted to enforce this causal-nexus requirement, instructing only that:

> "Marvell cannot be found to have directly or indirectly infringed in connection with chips that are never used in the United States. To the extent, however, that

> Marvell achieved sales resulting from Marvell's alleged infringing use during the sales cycle, you may consider them in determining the value of infringing use."

(12/21/12 Tr. at 63:1-6.) The second sentence of the instruction, added over Marvell's objection (12/20/12 Tr. at 3:24-4:20, 6:6-20, 7:24-8:1), failed to restrict the jury to those chips sold only as a result of infringing U.S. activity. By framing the requisite causal connection as one between the use of chips abroad and Marvell's "sales cycle," without clarifying that CMU's proof needed to establish that the sales cycle occurred ***within the United States***, this instruction erroneously invited the jury to impose impermissible damages for sales outside the United States. Nor did the instruction advise the jury what sort of proof would establish whether sales in fact "result[] from" infringing use in the United States or how the jury should assess one causal contributor to sales relative to another, particularly in the face of testimony that Western Digital, while purchasing many of Marvell's chips at issue, did ***not*** want the patented technology. The instruction thus fell short of "full and complete instructions" that are required to relate "the law to the relevant evidence in the case" for the benefit of a jury. *Smith v. Borough of Wilkinsburg*, 147 F.3d 272, 279-80 (3d Cir. 1997); *Dressler*, 143 F.3d at 783 (3d Cir. 1998) (instruction must advise "jury of concepts it needs to know to properly discharge its duties").

Such legal error, if not corrected by JMOL in Marvell's favor limiting damages to chips used in the United States, is grounds for grant of new trial. *E.g.*, *Dressler*, 143 F.3d at 781, 783; *Harvey v. Plains Twp. Police Dep't*, 635 F.3d 606, 612-13 (3d Cir. 2011); *Beardshall v. Minuteman Press Int'l, Inc.*, 664 F.2d 23, 26-27 (3d Cir. 1981); *Lowry v. A/S D/S Svendborg*, 396 F.2d 850, 852-53 (3d Cir. 1968).

Nor was the error harmless. The jury would likely have reached a different result if informed of the relevant standard. The jury instruction quoted above was the only jury instruction governing whether CMU's novel theory for including chips never used in the United

States should be included in the royalty base. Given that vast bulk of the $1.17 billion verdict turned on this issue, the error in the instruction very likely contributed to the jury's award.

3. In the Alternative, The Proper Royalty Base Requires Remittitur To $164,648,899 Or $278,406,045.5

"[W]here the court can identify an error that caused the jury to include in the verdict a quantifiable amount that should be stricken," remittitur should be granted in that quantifiable amount. *Cornell Univ. v. Hewlett-Packard Co.*, 609 F. Supp. 2d 279, 292 (N.D.N.Y. 2009) (Rader, C.J., sitting by designation) (*citing Joiner Sys., Inc. v. AVM Corp.*, 517 F.2d 45, 49 (3d Cir. 1975)) (other citations and internal quotation marks omitted) (granting JMOL and, in the alternative, remittitur with respect to a royalty base). Absent JMOL for Marvell on the royalty base, this Court should exercise its discretion to grant Marvell's motion for remittitur. This is clearly a case in which the Court can identify an error that caused the jury to include in the verdict "a quantifiable amount that should be stricken."

For reasons set forth above in Part III.A, the jury here erroneously included **2,008,982,744** chips in its damages calculation, even though the overwhelming majority of those chip were never used in the United States and the record failed to tie them causally to infringing conduct in the United States. Accordingly, the maximum number of chips a properly instructed jury could have included in the royalty base on this record is only the **329,297,798** chips used in the United States as to which Ms. Lawton provided colorable evidentiary support or at most the **556,812,091** chips as to which Ms. Lawton provided conclusory testimony. Accordingly, if it does not grant JMOL in Marvell's favor and upholds a $.50/chip royalty, this Court should grant remittitur of the award to **$164,648,899** or **$278,406,045.5**.

B. Marvell Is Entitled To New Trial Or Remittitur On The Royalty Rate

1. The Jury's Award Of A $.50/Chip Royalty Rate Was Against The Weight Of The Evidence

If this Court does not grant JMOL to Marvell on the royalty rate, it should exercise its discretion to grant a new trial because the award of a $.50/chip running royalty is "clearly not supported by the evidence." *Laserdynamics, Inc.*, 694 F.3d at 81. *See also Brooke Group Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 242 (1993); *Wordtech*, 609 F.3d at 1319-22.

2. In the Alternative, This Could Should Grant Remittitur To $70,148,416, $16,704,363, $9,878,934, $20,000,000, Or $400,000

For the reasons set forth in Part III.B *supra*, the award of a $.50/chip royalty for a total award of $1,169,140,271 is plainly excessive, warranting remittitur. *Spence*, 806 F.2d at 1201; see *Cornell Univ.,* 609 F. Supp. 2d at 292. No reasonable jury could arrive at such an enormous royalty in light of at least the following uncontroverted evidence at trial:

- After careful consideration, deans, department heads, and the director of licensing for CMU determined that a one-time payment of $200,000 was fair market value for at least one of the patents-in-suit. (DX-262, DX-263, DX-264, DX-1605; 12/5/12 Tr. 192:15-193:14.)
- The inventors believed that a one-time payment of $200,000 was fair compensation for a license to each of the patents-in-suit. (DX-263.)
- CMU's "highly speculative" projection set $2 million annually as its best case for actual licensing in 2006 and 2007. (DX-272; DX-299.)
- There is no evidence that IBM, Seagate, or 3M ever used the patented methods despite having access to the patented technology pursuant to DSSC Agreements.
- Intel declined CMU's offer to license one of the patents-in-suit for a one-time payment of $200,000. (12/10/12 Tr. at 180:3-13.)
- CMU sent 14 letters to various industry players in an effort to generate interest in licensing the patents-in-suit but received no positive responses. (P-442; DX-224, DX-225, DX-226, DX-227, DX-229, DX-230, DX-231, DX-232, DX-233, DX-234, P-431, DX-1573; 12/5/12 Tr. at 149:10-150:15, 169:5-9, 170:3-5.)
- CMU never received any royalties from anyone for use of the patented methods. (12/5/12 Tr. at 132:1-12.)

- CMU's own expert on intellectual property damages testified that a $.50/chip royalty would preclude Marvell from earning an "adequate" return to justify the continuation of its business. (12/10/12 Tr. at 86:5-16, 259:12-24.)

In light of this same evidence, the $.50/chip royalty would be excessive even upon a royalty base of 329,297,798 or 556,812,091 chips, the maximum possible number appropriate to that base because used in the United States.

To avoid such excessive damages, this Court should order remittitur to **$400,000**, consistent with the $200,000 flat rate at which each of the two patents would actually have been licensed (DX-262, DX-263, DX-264, DX-1605; 12/5/12 Tr. 192:15-193:14; 12/10/12 Tr. at 180:3-13), or to **$20 million**, consistent with the $2 million annually CMU set forth as its "best-case" licensing projection for 2006 and 2007, carried back to March 2003 (DX-272; DX-299).

Alternatively, the Court should order remittitur consistent with the royalty rate supported by the evidence of Marvell's pricing to more representative customers than Marvell. In particular, Ms. Lawton calculated an alleged profit premium of $.06/chip[7] for sample chips sold to Toshiba, a customer that purchased 408 million chips, some 46 times more than the small and unrepresentative customer Maxtor, which purchased only 8.8 million chips. (D-Demo 11 (CL-11); P-Demo 16 (Table 13); 12/10 Tr. (Lawton) 98:1-18; 12/13 Tr. (Hoffman) 105:7-9.) Ms. Lawton found no profit premium for Marvell's other larger customers, however, and the evidence shows that Western Digital paid no premium for chips with the accused technology. Since Western Digital purchased about one-half of the accused chips, the rate should be far less than

[7] Marvell offers this calculation *arguendo*, while respectfully disagrees with Ms. Lawton's $.06/chip calculation for sample chips sold to Toshiba as well as the premise that it is representative of any premium obtained at Toshiba for the 408 million production chips sold to Toshiba. Marvell also respectfully disagrees that a running royalty is appropriate. Even so, while a $.03/chip royalty rate is too high, it is still more appropriate than a $0.50/chip royalty rate.

the $.06/chip margin Ms. Lawton calculated for Toshiba, and certainly less than $.03/chip. A $.03/chip royalty rate would yield maximum damages as follows:

- **$70,148,416** if the Court used the entire royalty base of **2,338,280,542** chips that Ms. Lawton and the jury used;
- **$16,704,363** if the Court used a royalty base consisting of Ms. Lawton's conclusory, higher estimate of the U.S. chips (**556,812,091** chips);
- or **$9,878,934** using a royalty base consisting of the lower estimate of the US chips given by Ms. Lawton (**329,297,798** chips) .

Remittitur to any of these amounts would be well within the Court's discretion and an appropriate means of preventing imposition of the jury's grossly excessive damages award.

V. CONCLUSION

For the foregoing reasons, Marvell is entitled to judgment as a matter of law pursuant to Rule 50(b) as to damages and/or, in the alternative, new trial or remittitur pursuant to Rule 59.

Dated: February 11, 2013

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on February 11, 2013, the foregoing was filed electronically on ECF. I also hereby certify that on February 11, 2013, this filing will also be served on counsel for CMU by electronic mail.

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UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS EASTERN DIVISION

BRANDEIS UNIVERSITY and GFA BRANDS, INC.,	)	
	)	Nos. 1:12-cv-01508
Plaintiffs,	)	1:12-cv-01509
v.	)	1:12-cv-01511
	)	1:12-cv-01513
KEEBLER CO.; FAMOUS AMOS CHOCOLATE CHIP COOKIE COMPANY, LLC; MURRAY BISCUIT CO. LLC; VOORTMAN COOKIES LTD.; BREMNER FOOD GROUP, INC.; COOKIE SPECIALTIES INC.; TOPCO ASSOCIATES LLC; and NESTLÉ USA, INC.,	)	Judge Richard A. Posner.
Defendants.	)	

ORDER OF JANUARY 18, 2013

POSNER, *Circuit* Judge, sitting by designation. I conducted a *Daubert* hearing on January 11, 2013, to consider challenges, based on Fed. R. Evid. 702 and pertinent judicial decisions, to the expert opinions offered in support of the parties' liability and damages theories against Keebler. (The plaintiffs are settling with Bremner and Topco, leaving Keebler as the only defendant with whom they are planning on going to trial.) I also instructed the parties to brief two issues of claim construction that arose in relation to the *Daubert* hearing. I address the issues of claim construction first.

Claim Construction

Weight of fatty acids. Many of the numerical ranges and ratios in the defendants' patents express the quantity of specific fatty acids as a percentage of the weight of the blended fat composition. For example, claim 1 of the '192 patent describes a "fat composition" that "comprises between 15% by weight and 40% by weight linoleic acid" and "between 20% and 40% by weight saturated fatty acids." My *Markman* order of August

24, 2012 addresses the denominator in these ratios, stating that the weight of the fat composition "describes the constituents' weight in terms of the weight of the triglycerides in the blended fat composition." My order does not address the numerator, the weight of the fatty acids themselves. Fatty acids contain a hydroxide group (an oxygen atom bonded with a hydrogen atom) that is lost when fatty acids combine with glycerol to form a triglyceride. The *Daubert* challenge to Dr. Peter Jones's testimony raises the question whether the weight of the hydroxide group should be included in the weight of the fatty acid. The defendants complain that Dr. Jones ignored the standard methodology used by nutritionists and food scientists when he excluded the weight of the hydroxide group from his calculations. The plaintiffs point out that this is a question of claim construction—what does the patent mean when it says "% by weight" of a type of fatty acid?—rather than, as the defendants suggest, a question about the reliability of Dr. Jones's methodology. But the defendants provide compelling evidence to support their construction.

The strongest support for the defendants' construction is in the patent. Patent claims "must be read in view of the specification, of which they are a part"; the specification is "the single best guide to the meaning of a disputed term." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005). Evidence from outside the patent is relevant only if it doesn't contradict the specifications. See *id.* at 1323.

The patent specifications support the defendants' construction. Tables I and II of the patent describe the fat composition of various oils. For example, Table I shows that sunflower oil is composed of 9.1% by weight saturated fatty acids, 12.1% by weight monounsaturated fatty acids, and 74.5% by weight polyunsaturated fatty acids. The tables further break down each oil into individual fatty acids. For example, Table I shows that sunflower oil is composed of 6.2% by weight palmitic acid, a type of saturated fatty acid, which is denoted as 16:0 on the chart. The fat compositions of each of these oils—except two (canola oil and palm olein)—are drawn from the U.S.D.A.'s. Agricultural Handbook No. 8-4, *Composition of Foods: Fats and Oils* (1979), http://naldc.nal.usda.gov/download/CAT87209368/PDF (visited Jan. 18, 2013).

The plaintiffs concede that the fat compositions for each oil, except canola oil and palm olein, were calculated by the method proposed by the defendants: dividing the total weight of all fatty acids in the oil (including the weight of the hydroxide group) by the total weight of all triglycerides in the oil (as explained by my *Markman* order). Fatty acids account for approximately 95% of the weight of a triglyceride if the hydroxide group is included, but only 90% if it is excluded. So if the sum of the saturated, monounsaturated, and polyunsaturated fatty acids in an oil add up to approximately 95% of the oil's weight, rather than 90%, this is proof that the weight calculations included the

weight of the hydroxide group—and sure enough, they do. For example, in sunflower oil, the saturated (9.1%), monounsaturated (12.1%), and polyunsaturated (74.5%) fatty acids add up to 95.7% of the weight of the oil.

The results are similar for every oil in the two tables except palm olein. In Table II its fatty acids are 100% of the oil's weight, which according to the plaintiffs means that the figures for palm olein were calculated by dividing by the total weight of fatty acids rather than the total weight of triglycerides. That method of calculation is inconsistent with my *Markman* order and with the method used to weigh all the other oils described in the patent. The proper method, advocated by Keebler, is the one used to calculate the fat composition of the other oils—dividing the total weight of the fatty acids, including the hydroxide group, by the total weight of the triglycerides.

This method is further supported by the examples of infringing oils described later in the patent. Examples 1, 2, and 3 describe three blends of oil that fall within the weight ratios claimed by the patent. Thus Example 1 describes a blend of "Two parts palm oil (44% palmitic, 9% linoleic acid) ... blended with one part corn oil (11% palmitic acid, 58% linoleic acid) to provide a balanced fat blend containing approximately 33% palmitic acid (16:0) and 25% linoleic acid (18:2)." The percentages used in all three examples are taken from Tables I and II, rounded to the nearest whole number. These examples confirm that the drafters of the patent had the same method in mind when they claimed a "fat composition" that "comprises between 15% by weight and 40% by weight linoleic acid" and "between 20% and 40% by weight saturated fatty acids."

The plaintiffs point out that the hydroxide group is not actually present in the fat composition. A fat composition is made up primarily of triglycerides, and triglycerides are composed of three fatty acids that have shed their hydroxide group bonded to a glycerol molecule that has shed its hydrogen atom, forming water. The plaintiffs complain that it is scientifically unsound to express the weight of fatty acids that comprise a fat composition in terms of a molecule that is not present in the fat composition. That might be persuasive if it were an unusual way to express the weight of fatty acids. But Keebler's method is used by the Department of Agriculture and the Food and Drug Administration, and endorsed by the Association of Analytical Communities; and the patent itself uses it to measure the percentage of fatty acids in various oils and blends.

I therefore construe "% by weight" of a fatty acid to mean the ratio of the weight of that fatty acid in the fat composition, including the hydroxide group, to the total weight of the triglycerides in the fat composition.

Stable Emulsion. My *Markman* order defines margarine as "a butter substitute, having flavorings or other additives, that constitutes an emulsion with a water phase and

an oil phase." The parties dispute whether an emulsion must be stable to qualify as a margarine, and if so, how stable. The plaintiffs are correct that stability is a matter of degree; a completely unstable emulsion would separate. But this does not mean that an emulsion must last forever. The patent defines "stable emulsion" as an emulsion that "does not physically separate to form a second liquid phase during the lifetime…of the product." To be a butter substitute, margarine must be an emulsion that retains its emulsion phase long enough to be a usable substitute, as the plaintiffs' own expert Mr. Harold Russell has conceded. Although this was implicit in my original *Markman* order, I now clarify that "margarine," as used in the '192 patent, means "a butter substitute, having flavorings or other additives, that constitutes an emulsion with a water phase and an oil phase, sufficiently stable to function as a butter substitute."

***Daubert* Challenges**

At the *Daubert* hearing I questioned a number of the challenged experts. Some were not challenged; I have looked at their reports and have no reason to doubt that they are indeed competent to testify.

Peter Jones. Dr. Jones is the plaintiffs' principal proposed expert witness on liability, addressing in his expert report both infringement and validity issues. Keebler has moved to exclude his testimony that the margarines used in Keebler's cookies are "cholesterol free," as claimed by the patent, and his method of weighing the ingredients in Keebler's cookies. I also questioned him about his testimony that Keebler's cookies produce the same health benefits as products containing the patented margarine.

1. My *Markman* order construed "cholesterol free" to mean "containing less than 2 mg cholesterol per serving, and containing no ingredient generally understood by consumers to contain cholesterol (such as cholesterol-containing milk solids or beef fat)." Dr. Jones is a biochemist; whether Keebler's ingredients (such as egg powder) are generally understood by consumers to contain cholesterol is not a biochemical issue. I therefore will not permit him to testify that Keebler's products contain no ingredients generally understood by consumers to contain cholesterol.

2. In my new *Markman* ruling, above, I conclude that the weight of a fatty acid includes the weight of the hydroxyl group that is lost when three fatty acids combine with glycerol to form a triglyceride. Because Dr. Jones's calculations exclude this hydroxyl group, they are irrelevant to whether Keebler infringed the patent.

3. The patent claims a margarine with a specific fat composition that is believed to have positive health benefits by increasing the amount of HDL ("good" cholesterol) in the blood and raising the ratio of HDL to LDL ("bad" cholesterol). It was on the basis of

those benefits that the patent was deemed useful and was granted. My *Markman* ruling interprets the patent to be infringed only by a margarine that produces those health benefits.

Dr. Jones's initial and rebuttal expert reports rely primarily, as evidence of the health effects of the patented margarine, on the Sundram study, in which a high dose of the patented invention was fed to 23 male Malaysian soldiers (a 24th started but did not complete the study) for 4 weeks in the early 1990s. This was a very small sample of persons who doubtless have very different diets from Americans, and a sample that included neither women nor civilians, nor children, nor elderly persons. And though the soldiers' diets were rotated to enable the health effects of the patented invention to be compared with the health effects of diets not containing it, all the soldiers were given the invention in their initial diet and their bodies may have adapted to it, which would have reduced the beneficial effect of the alternative diets. The patented invention accounted for a very high percentage of the soldiers' fat intake during the test period, and Dr. Jones is unable to estimate the health benefit that a margarine spread or cookie containing margarine would confer on a person having a normal diet. He said it would be "physiologically meaningful" but conceded that the effect could be extremely small. But none of these problems preclude his testifying about infringement; for as I explained in my *Markman* order, the patents require only that a described blend exhibit the stated HDL effects in a study similar to the Sundram study.

Dr. Jones relied on, besides the Sundram study, two studies conducted on human beings and two studies on various species of monkeys. One of the human studies [...REDACTED...] Dr. Jones's report and exhibits fail to provide enough detail about the study's methodology and results to conclude that it is a reliable study, so he may not testify about it. The other human study, published by Dr. Ana Maria Lottenberg in 1996, showed that a fat blend similar to the Sundram blend increased HDL, but did not say whether it also significantly increased the HDL/LDL ratio. Ana Maria P. Lottenberg et al., "Plasma Cholesterol Ester Synthesis, Cholesterol Ester Transfer Protein Concentration and Activity in Hypercholesterolemic Women: Effects of the Degree of Saturation of Dietary Fatty Acids in the Fasting and Postprandial States," 126 *Atherosclerosis* 256 (1996). This study provides some support for the Sundram study, and he may testify about it. Finally, Dr. Jones discussed two studies on different species of monkeys, but was unable to evaluate the significance of studies on monkeys for human consumption, other than to say that monkeys are genetically rather similar to human beings. "In order for animal studies to be admissible to prove causation in humans, there must be good grounds to extrapolate from animals to humans." *In re Paoli R.R. Yard PCB Litigation*, 35 F.3d 717, 743 (3d Cir. 1994); see also *Allison v. McGhan Medical Corp.*, 184 F.3d 1300, 1314

(11th Cir. 1999). Dr. Jones hasn't offered any "good grounds," and so may not testify about the studies on monkeys.

Dr. Jones also supports his conclusions about health effects by identifying a biological mechanism that explains the results of the Sundram and Lottenberg studies. He says that a combination of saturated fatty acids and certain polyunsaturated fatty acids causes the liver to increase production of both HDL and LDL while simultaneously clearing LDL from the bloodstream. This mechanism provides a scientific basis for Dr. Jones's testimony that other fat blends would exhibit the same effects, since the liver would respond similarly to different fat blends. Therefore, he may testify that the claimed health effects would be generalizable to other fat blends.

Alice Lichtenstein. Dr. Lichtenstein is Keebler's expert on the claimed health effects of the patented invention. She opines that the Sundram study does not generalize to other populations or to persons whose diets contain only a small amount of the fat blend. And she argues that the study's finding regarding health effects cannot be generalized to all fat blends within the claimed range, and therefore that the patent does not enable reproduction of the patented product.

She cites five studies that she claims cast doubt on the Sundram study. Essi S. Sarkkinen et al., "Long-term Effects of Three Fat-modified Diets in Hypercholesterolemic Subjects," 105 *Atherosclerosis* 9 (1994); Ursel Wahrburg et al., "Comparative Effects of a Recommended Lipid-lowering Diet vs a Diet Rich in Monounsaturated Fatty Acids on Serum Lipid Profiles in Healthy Young Adults," 56 *Am. J. Clinical Nutrition* 678 (1992); Susan Learner Barr et al., "Reducing Total Dietary Fat Without Reducing Saturated Fatty Acids Does Not Significantly Lower Total Plasma Cholesterol Concentrations in Normal Males," 55 *Am. J. Clinical Nutrition* 675 (1992); Timo Kuusi, "Concentration and Composition of Serum Lipoproteins During a Low-fat Diet at Two Levels of Polyunsaturated Fat," 26 *J. Lipid Research* 360 (1985); Randall Wood et al., "Effect of Palm Oil, Margarine, Butter, and Sunflower Oil on the Serum Lipids and Lipoproteins of Normocholesterolemic Middle-aged Men, 4 *J. Nutritional Biochemistry* 286 (1993).

The plaintiffs argue that these studies do not contain enough data to enable a determination of whether the fat blends that were studied infringe the patent. Several of the studies are silent on whether the blends contain trans-fats, so it is not clear whether they contain "no more than 1% elaidic acid or other unnatural trans fatty acids by weight," as the patent requires. But Dr. Lichtenstein testified that under reasonable assumptions the studies' blends fall within the claimed ranges, and that even if they do not the studies challenge the existence and magnitude of the HDL/LDL effect claimed by the patent. The plaintiffs object to the experimental designs: some studies (Barr and

Kuusi) changed several variables in the subjects' diets at once while others (Sarkkinen and Wood) relied on participants to cook and record their own meals and could not guarantee that they followed directions precisely. These flaws limit the conclusions that can be drawn from these studies, but they do not show that the studies are worthless. Indeed, in several respects these studies are more trustworthy than Sundram: all of them were larger, and tested more varied samples; and each study randomized the order in which various diets were fed to the subjects, to account for the possibility that subjects might adapt to the diets that they were fed first.

Dr. Lichtenstein may testify that the studies she mentions indicate that some fat blends within the patent's ranges do not produce the claimed health effects, and also that the studies cast doubt on the validity of the Sundram study. She may not testify that the studies directly contradict the Sundram study, because of the differences in experimental designs.

Ira Walman. Mr. Walman is an industrial baker, offered to testify as an expert for the plaintiffs, primarily on whether the patented product is a margarine as defined in my original *Markman* order. His report precedes my new *Markman* order, but the order doesn't invalidate his testimony. His experience qualifies him to testify that Keebler uses a mixture of ingredients as a butter substitute—that Keebler could substitute butter for some of the ingredients in its cookies, and the butter would perform the same function as those ingredients, though possibly with a different effect on taste and/or texture. He testified at the *Daubert* hearing that the same mixture of ingredients forms an emulsion, and moreover an emulsion that is stable for the normal life of the cookies or other products in which the margarine is incorporated. He based this opinion not on tests that he conducted—he conducted no tests—but on the ingredients of the margarine and the process in which they are mixed to form the margarine. He said that as an industrial baker he has to know whether something is a stable emulsion and he forms that knowledge from a study of the ingredients and the process of mixing them. I accept that and therefore deny Keebler's motion to exclude him from testifying.

Harold Russell. Mr. Russell is a food-industry chemist. His testimony supported Mr. Walman's. I conclude that he is qualified to testify on the emulsion issue. Keebler's motion to exclude him is denied.

Allan Roden. Mr. Roden is another food-industry chemist, but testifying for Keebler. He claims that the fat mixture that Keebler produces during manufacturing is not a stable emulsion and therefore not a margarine. Oddly, he bases this conclusion mainly on

tests that he conducted in his home in Noblesville, Indiana, on a sample of Keebler's cookie batter, which had been shipped to him via UPS (apparently from Keebler's factory in Cincinnati). The shipment had taken a day and a half and was not temperature controlled, although he said it was "pretty cold outside" and denied there was any reason to suppose that the length or conditions of the transportation of the product to his house would have affected the tests he conducted. He concluded from his inspection of the batter in his home that it is not a stable emulsion, and reinforced his conclusion at his deposition by testifying that he had seen photos of the product as it is prepared, showing that the oils and water constituting the product separate immediately upon being mixed. The photographs are in the record, but they are not in his report. He tasted the batter and testified that it contained too much sugar to be considered a butter substitute.

Conducting a test in one's home of a product that has been in transit for 36 hours strikes me as unprofessional; there is no suggestion that it is an industry practice. Mr. Roden has offered no evidence that the mixture he tested was in the same condition it left Keebler's factory, and there has been ample time for him to visit the factory (which is not far distant from his home—Noblesville is only 126 miles from Cincinnati, approximately a two-hour drive) and test the accused mixture there, but he hasn't done so. I will not permit him to testify as to his personal examination of the mixture.

He also gives Keebler's recipes and manufacturing processes as evidence for his conclusion that it does not make a margarine. His report states that margarines may be made only with a votator (a machine, also called a scraped surface heat exchanger, which allows oil molecules to crystallize around water droplets), which Keebler doesn't use to mix its cookie batter. But Mr. Roden admitted at his deposition that margarines can be made in other ways, since the invention and sale of margarine predate the invention of the votator. He therefore may not testify that all margarines are made with votators, though he may describe the various methods of producing margarines and the likelihood that the methods used by Keebler produce a margarine.

He also opines that the margarine described in the patent is anticipated by two prior art references. The plaintiffs take issue with his interpretation of these references and his conclusions, not his methodology. He may testify about those prior-art references.

The plaintiffs' motion to exclude Mr. Roden's testimony granted with respect to his personal examination of the Keebler cookie batter and his claim that all margarines are made with a votator, but is otherwise denied.

Anne Layne-Farrar. Dr. Layne-Farrar is the plaintiffs' damages expert and is a highly qualified consulting economist. There is no doubt about her general competence to estimate damages, in this case in the form of a reasonable royalty for Keebler's alleged in-

fringing use of the plaintiffs' product during the roughly five years between the beginning of the alleged infringement and the scheduled date of trial (March of this year). The reasonable royalty is the price that Keebler would have paid to GFA (the plaintiff that does the licensing of the plaintiffs' patent) had it negotiated for a license before it started using the infringing blend rather than risk being sued for patent infringement. E.g. *Lucent Technologies, Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1324 (Fed. Cir. 2009).

Keebler would not have paid a royalty higher than the cost to it of switching to a noninfringing substitute for the plaintiffs' margarine in its cookies or otherwise reworking its manufacturing process to avoid making the infringing margarine. Dr. Layne-Farrar testified (in her report and in answer to my questions) that there was no cheap and satisfactory substitute for the plaintiffs' fat blend that would not contain trans-fats. In order to avoid infringing while also avoiding trans-fats (the primary commercial value of the plaintiffs' margarine is not its effect on HDL and the HDL/LDL ratio but that it does not contain trans-fats), Keebler would have had to consider the possible effects of substituting a non-infringing oil blend on other elements of consumer demand besides aversion to trans-fats. These elements, she testified, include consumer aversion to sogginess in cookies (a possible result if the cookies contained a noninfringing oil blend that had a high ratio of unsaturated to saturated fat), and aversion to saturated fat (a result if for example butter, which contains no trans-fats, was used in place of the patented margarine).

Dr. Layne-Farrar is not an expert on consumer demand for cookies and how it is affected by a manufacturer's choice of ingredients. An expert witness is not bound by the hearsay rule, however, and it makes sense that an economist asked to calculate a reasonable royalty for a consumer product would consult an expert on sales or marketing. She testified that conversations with Dr. Jones persuaded her that increased sogginess would be a real problem for Keebler if it switched to any non-infringing oil blend and would induce it to pay a substantial royalty for a license from GFA rather than substitute some other ingredient for the plaintiffs' that would be free of trans-fats.

But Dr. Jones is not involved in the marketing of food products, and though as a biochemist specializing in the biochemistry of food he could discuss the properties of fats in general, he is not a food scientist. His report is silent on sogginess, and at the *Daubert* hearing he testified that there are substitutes for the plaintiffs' invention that wouldn't result in a soggy cookie. He mentioned beef fat, because it's high in stearic acid. Of course a cookie made of beef fat sounds exceedingly unappetizing. But Dr. Jones did not opine on whether the beef could be processed in a way consistent with maintaining the desired taste and texture of a cookie.

The plaintiffs' expert who would know about sogginess would be Mr. Walman, the industrial baker—but Dr. Layne-Farrar never discussed the issue with him. I don't understand her failure to discuss texture with him, or consumer demand for cookies more broadly with someone involved in the marketing or sale of cookies, and instead to have discussed it only with Dr. Jones. I conclude that she cannot rely on Dr. Jones for the conclusion that there are no noninfringing alternatives to the patented oil blend that would cost Keebler less, in production costs and loss of sales, than a hefty royalty to the plaintiffs.

Maybe there's no perfect substitute for the patented invention (or something quite like it) and that that's why Keebler risked being sued for infringement—which is not to say that it did infringe, only that it came close enough to doing so, as it must have known, to court an infringement suit. Maybe butter, which would neither infringe nor contain the dreaded trans-fats nor produce a soggy cookie, would have too much saturated fat to be suitable; this is a possible inference from the fact that Keebler did not return to using butter when it eliminated trans-fats. But even if there is no perfect substitute, this by itself would not allow the estimation of a reasonable royalty. For that royalty would depend on the cost, in higher production costs and loss of business to competitors, of the best imperfect substitute; and Dr. Layne-Farrar offered no evidence about either cost.

In fact she based her calculation of a maximum reasonable royalty not on costs, but on the maximum profits of Keebler that she deemed at risk if Keebler didn't get a license from GFA. On this basis she came up with a figure ($[#] a year) roughly [#] times what GFA had charged [Company A] for a similar license. She based this figure on the fact that between 2002 and 2005 (two to five years before the alleged infringement began), Keebler's market share had declined. She relies on an industry analyst who opined that the loss of market share was related to Keebler's failure to eliminate trans-fats. But she didn't determine the reliability of that sole analyst's opinion. Cf. *TK-7 Corp. v. Estate of Barbouti*, 993 F.2d 722, 732–33 (10th Cir. 1993). Nor does she provide any basis for assuming that the 2002 to 2005 trend—a mere three years—would have persisted for seven more years, an assumption essential to her $[#] calculation.

Besides the decline in market share, she relied on the royalty that [Company B] agreed to pay GFA in settlement of the patent infringement suit brought against it. [Company B] is [...REDACTED...], wholly dissimilar to Keebler [...REDACTED...]. [Company B] make just two cookies [...REDACTED...] alleged to infringe the '497 patent, which is not the patent that Keebler is alleged to infringe. The license fee was slight in absolute terms ($[#]-[#] a year, plus about a $[#] lump sum for past infringement). There was no basis for Dr. Layne-Farrar to apply the percentage that the fee represented

of [Company B's] sales to Keebler's vast sales. See *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51, 77–78 (Fed. Cir. 2012). Dr. Layne-Farrar's testimony as to the [Company B] license is excluded.

Like Keebler, [Company A] is a large food conglomerate that makes baked goods that are alleged to infringe. [Company A] has a non-exclusive license from GFA for the patents at issue for the flat rate of $[#] per year. Dr. Layne-Farrar points to it as the minimum royalty that GFA would accept, but argues that GFA would demand more from Keebler because changes since GFA negotiated the [Company A] license in 2005 would drive GFA to insist on a higher royalty. In 2006 GFA merged with Boulder Specialty brands, increased its sales, and is alleged to have been making plans to expand beyond the margarine-spreads business. Keebler's alleged infringement began in 2007, but that was too soon after the merger to enable even a minimally confident prediction of how hard GFA would have pushed Keebler. Her theory that GFA did not pursue an economically optimal deal with [Company A] in 2005 is pure conjecture, unanchored in any data. And even if GFA would have pressed harder in negotiating with Keebler, it doesn't follow that it would have succeeded in inducing a higher royalty than [Company A] had paid; for as we saw, there is no evidence of the cost to Keebler of substituting a noninfringing blend of oils for the patented margarine. Yet the similarity of [Company A's] products to Keebler's allows an inference, to which Dr. Layne-Farrar can testify, that Keebler would have paid as much as [Company A] did for a license.

Dr. Layne-Farrar discusses a license that GFA granted on [date] (in settlement of litigation), to [Company C], the parent of [Company D], one of the alleged infringers of the plaintiffs' patent. The stated payment for the license is a $[#] one-time payment to GFA, but the payment appears to have been returned to [Company C] as "consulting fees" over the next few months. The settlement also provides, however, for changing a strategic partnership between [Company C] and a GFA subsidiary [...REDACTED...] In return for these benefits, GFA agreed to dismiss its patent suit against [Company D] and grant [Company C] a license to [#] GFA patents, including the patent at issue in this case.

Dr. Layne-Farrar notes as bearing on the possible cost of the license to [Company C] a statement in the settlement agreement that the settlement's value "equals or exceeds $[#]" and a claim by the CEO of GFA that it may be as much as $[#]. Neither of these self-serving statements, apparently made for litigation purposes, can be the basis of a reliable calculation by an economist. Since [Company C] was persuaded as part of the settlement to give [...REDACTED...], Dr. Layne-Farrar opines that the license it received in return was also worth either $[#] or $[#]. But she has made no attempt to value any individual component of this complex settlement agreement, and so she cannot respon-

sibly value the patent license itself. Her testimony concerning the [Company D] license must therefore be excluded.

She has not used a reasonable methodology to calculate the plaintiffs' damages by reference to the [Company B] license, the [Company C] license, or profits at risk, or to assess the cost of noninfringing alternatives. The [Company A] license, however, remains a possible basis for estimating a reasonable royalty for a license to Keebler. She may testify to that, and also to general principles of patent damages. Thus Keebler's motion to exclude Dr. Layne-Farrar is granted in part and denied in part.

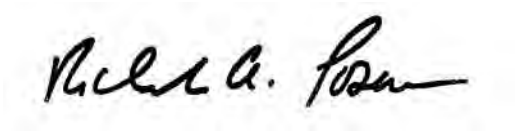
Eric Decker. The plaintiffs also challenged two Keebler experts who did not testify at the hearing, Drs. Decker and Keeley. Dr. Decker is a food science professor who opines that the sugary fat mixture made during the production of Keebler's cookies is not an infringing margarine because it is not "cholesterol free" as I have construed the term. He says the mixture contains more than 2 mg of cholesterol per serving, and contains ingredients generally understood by consumers to contain cholesterol, both limitations inherent in "cholesterol free". Dr. Decker is qualified to measure the cholesterol in the mixture and may testify on that subject. But like Dr. Jones he has no specialized knowledge about what ingredients consumers generally understand to contain cholesterol. He may not testify about that. The plaintiffs' motion to exclude Dr. Decker's testimony on noninfringement is therefore granted in part and denied in part.

Dr. Decker also opines that changing the order in which ingredients are mixed, by adding egg powder earlier in the process for example, would yield a non-infringing substitute for the current cookie dough. The plaintiffs contend that his failure to test whether these modifications would yield a commercially viable cookie is fatal to his opinion. But in lieu of testing he relies on his knowledge about food science and the fact that Keebler has previously used the modified manufacturing process. Those are reasonable bases for his opinion on the existence of non-infringing substitutes. The plaintiffs' motion to exclude Dr. Decker's testimony on non-infringing substitutes is denied.

Michael Keeley. Dr. Michael Keeley is an economist retained by Keebler whose opinion that the reasonable royalty for use of the patented oil blend is negligible is based primarily on Dr. Decker's opinion that acceptable non-infringing substitutes for it exist. Since I am permitting Dr. Decker to offer that opinion, Dr. Keeley can rely on it. The plaintiffs' motion to exclude Dr. Keeley's opinions is denied.

Motion to strike Exhibit H to the defendants' motion to exclude Dr. Jones's testimony

The plaintiffs want me to strike Exhibit H to the defendants' motion to exclude Dr. Jones's testimony. This exhibit presents a number of weight measurements at variance with Dr. Jones's. The plaintiffs claim that the submission was untimely; that the defendants should have submitted these measurements much earlier, and that the plaintiffs have been prejudiced by the delay. The defendants state that they don't intend to introduce Exhibit H at trial, that it is only relevant to their motion to exclude Dr. Jones's testimony. Because I am granting that independent of Exhibit H, the motion to strike the exhibit is denied.



United States Circuit Judge

January 18, 2013