

**UNITED STATES DISTRICT COURT  
WESTERN DISTRICT OF PENNSYLVANIA**

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

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**PLAINTIFF’S MEMORANDUM OF LAW IN SUPPORT OF MOTION FOR  
PARTIAL SUMMARY JUDGMENT DISMISSING DEFENDANTS’  
AFFIRMATIVE DEFENSE AND COUNTERCLAIMS OF UNENFORCEABILITY  
DUE TO INEQUITABLE CONDUCT**

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Plaintiff Carnegie Mellon University (“CMU”) moves for partial summary judgment on the inequitable conduct claims made by Defendants Marvell Technology Group, Ltd. and Marvell Semiconductor, Inc.’s (collectively, “Marvell”). Specifically, CMU seeks summary judgment in its favor on Marvell’s Sixth Affirmative Defense and Fifth and Sixth Counterclaims (collectively, the “inequitable conduct claims”), through which Marvell seeks to render unenforceable U.S. Patent Nos. 6,201,839 and 6,438,180 (collectively, the “CMU patents”).

## I. INTRODUCTION

Charges of inequitable conduct are “an absolute plague” in patent cases. *Therasense, Inc. v. Becton Dickinson and Co.*, 649 F.3d 1276, 1289 (Fed. Cir. 2011) (en banc). To put an end to this plague, the Federal Circuit in *Therasense* tightened the inequitable conduct standard “in order to redirect a doctrine that has been overused to the detriment of the public.” *Id.* at 1290. Under *Therasense*, Marvell bears the burden of proving **by clear and convincing evidence** that Drs. Kavcic and Moura: (1) withheld prior art references from the PTO that are material under a “but-for” standard, meaning that “the PTO would not have allowed a claim had it been aware of the undisclosed prior art,” *id.* at 1291; **and** (2) “acted with the specific intent to deceive the PTO” in doing so. *Id.* at 1290. These two requirements are independent of each other. *See id.* at 1290. Marvell cannot make either showing.

Marvell’s arguments on the materiality prong fail as a matter of law. Marvell’s inequitable conduct claims now rest upon three allegedly undisclosed references, but the evidence (including admissions by Marvell’s experts) shows that either the PTO considered the so-called undisclosed references, or those references are demonstrably cumulative of several references the PTO did consider. References that the examiner actually considered cannot support a claim for inequitable conduct, nor can references that are cumulative of other information that the examiner considered.

*See Molins PLC v. Textron, Inc.*, 48 F.3d 1172, 1185 (Fed. Cir. 1995) (“When a reference was before the examiner, whether through the examiner’s search or the applicant’s disclosure, it cannot be deemed to have been withheld from the examiner.”); *Honeywell Int’l Inc. v. Universal Avionics Sys. Corp.*, 488 F.3d 982, 1000 (Fed. Cir. 2007) (“Information cumulative of other information already before the Patent Office is not material.”). Standing alone, Marvell’s failure to satisfy the materiality requirement warrants summary judgment for CMU.

Marvell is likewise unable to satisfy the intent requirement. Marvell has adduced no evidence, let alone clear and convincing evidence, that Drs. Kavcic and Moura deliberately withheld these three references with the specific intent to deceive the PTO. The legal standard on this element is particularly high. Under *Therasense*, “when there are multiple reasonable inferences that may be drawn [from an inventor’s actions], intent to deceive ***cannot be found.***” *Therasense*, 649 F.3d at 1290-91 (emphasis added). Marvell cannot satisfy this strict standard.

The undisputed facts show that Marvell cannot carry its heavy burden on this issue, so the Court should grant CMU’s motion for summary judgment on the inequitable conduct claims.<sup>1</sup>

## II. UNDISPUTED FACTS

### A. Marvell’s Allegations

On April 29, 2010, Marvell amended (by consent) its answer and counterclaims to assert its inequitable conduct claims. *See* Dkt. 116. Those claims originally were premised upon the inventors’ alleged failure to disclose ten (10) allegedly material references to the PTO. Marvell, however, has abandoned its claims regarding seven (7) of the references,<sup>2</sup> and now bases its

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<sup>1</sup> Inequitable conduct is an issue for the Court, rather than the jury, to decide. *See General Electro Music Corp. v. Samick Music Corp.*, 19 F.3d 1405, 1408 (Fed. Cir. 1994). Thus, granting CMU’s motion will not intrude upon the jury’s role and will simplify the case.

<sup>2</sup> The prior art references that Marvell cites in its Amended Answer (Dkt. 116), but for which no Marvell expert provided an opinion of materiality, are: the Feig article (Dkt. 116 ¶ 32a); an abstract by Caroselli (*id.* ¶ 32b); U.S. Patent 5,461,644 (*id.* ¶ 32d); two articles by Barbosa (*id.* ¶ 32b); and textbooks by Haykin and Ljung (*id.* ¶ 32e-f). Marvell’s allegations based on these references lack supporting evidence and therefore fail as a matter of law. *See American Calcar, Inc. v. American Honda Motor Co.*, 651 F.3d 1318,

inequitable conduct claims upon the report of Dr. Proakis, who offered materiality opinions on only three references: (1) “the Quantum Work;” (2) the “IBM Work;” and (3) the “Barbosa SPIE” paper. *See* Ex. 1 at ¶¶ 243, 246, 249 and 250.<sup>3</sup>

### **1. The Quantum Work**

The Quantum Work is U.S. Patent 5,521,945 to Knudson (“the Quantum/Knudson patent”). *See* Ex. 2. The disclosure in the Quantum/Knudson patent is *identical* to the “Fitzpatrick patent” (U.S. 5,689,532). The Fitzpatrick patent is a continuation of the Quantum/Knudson patent so they share the same specification. *See* Ex. 3; *see also* Ex. 1 at ¶ 250 (admitting that these two patents have an “identical description” and “the very same disclosure”).<sup>4</sup> It is undisputed that the PTO considered the Fitzpatrick patent during its examination of the CMU patents. In fact, the Court already is familiar with the CMU patent file history relating to the Fitzpatrick patent, as it was the subject of arguments that Marvell made (but the Court rejected) in connection with both claim construction and the summary judgment motion for anticipation by the Worstell patent. *See* Dkt. 175 at 34-42; Dkt. 306 at 16-17.

### **2. The IBM Work**

According to Marvell, the IBM Work consists of the 1996 paper by Eleftheriou et al. (the “Eleftheriou ’96 paper”). *See* Ex. 5. The Eleftheriou ’96 paper describes a so-called “noise predictive” detector that uses a predictor filter in conjunction with the Viterbi detector. The authors of the ’96 Eleftheriou paper worked at IBM, and the Eleftheriou ’96 paper is one of several papers and patents by IBM related to noise predictive detectors that Eleftheriou co-

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1334 (Fed. Cir. 2011).

<sup>3</sup> “Ex. \_\_\_” refers to exhibits attached to the Declaration of Christopher M. Verdini in Support of CMU’s Motion For Partial Summary Judgment Dismissing Defendants’ Affirmative Defense and Counterclaim of Unenforceability Due to Inequitable Conduct, filed herewith.

<sup>4</sup> Kelly Knudson of the Quantum/Knudson patent is the same person as Kelly Fitzpatrick of the Fitzpatrick patent. *See* Ex. 4 at 276.

authored. The PTO considered several of these other IBM references during examination of the CMU patents, including U.S. Patent 6,105,766 (the “Coker/Eleftheriou ‘766 patent,” Ex. 6), U.S. Patent 5,784,415 (the “Chevillat/Eleftheriou ‘415 patent,” Ex. 7), and the 1992 paper, Chevillat, et al., “Noise Predictive Partial-Response Equalizers and Applications,” IEEE CC ’92 Conference Record, pp. 942-947 (the “Chevillat/Eleftheriou ’92 paper,” Ex. 8).

The disclosures in these IBM references are all very similar. In fact, Marvell’s experts confirmed Dr. Kavcic’s view that this group of IBM authors merely “recycle[ed] the same branch metric idea for a number of years . . . .” *See* Ex. 9 at 320:1-5. Dr. Blahut, one of Marvell’s technical experts who used to work at IBM, testified that the Eleftheriou ’96 paper and the Coker/Eleftheriou ‘766 patent are the “same technologies.” *See* Ex. 10 at 331:13-18. Likewise, Dr. Proakis testified that branch metric equations in the Eleftheriou ’96 paper and the Coker/Eleftheriou ‘766 patent are “mathematically equivalent.” *See* Ex. 4 at 138-141.

### **3. The “Barbosa SPIE” Paper**

The Barbosa SPIE paper is a 1995 paper by Dr. Lin Barbosa. *See* Ex. 11. This paper describes two approaches for addressing signal-dependent noise. Dr. Barbosa, however, did not develop any branch metric equations for his first approach because it has “some problems.” *See* Ex. 11 at 51. Instead, for this first approach Barbosa recommended the variance-dependent branch metric of the Zeng-Moon paper (which the PTO considered and is discussed in the background of the CMU patents). *See* Ex. 12 at col. 1:41-52 and Ex. 13 at col. 1:41-52. The Zeng-Moon branch metric uses only a single signal sample and therefore ignores the correlation between signal samples. *See* Ex. 14; Ex. 12 at col. 1: 51-52; Claim Construction Opinion [Dkt. 175] at 12 (stating the variance-dependent branch metric such as in the Zeng-Moon paper, which is equation (10) of the CMU patents, “does not take into account noise from other signal samples”). For his second approach, which Dr. Proakis relies upon (*see* Ex. 20), Dr. Barbosa developed a

branch metric, but just like the Zeng-Moon variance dependent branch metric, it used only a single signal sample, even according to Dr. Proakis. *See* Ex. 4 at 176:4-177:4; 293:10-294:2.

**B. The Lack of Evidence of Deceptive Intent**

Dr. Proakis testified unequivocally that he was not offering any opinions regarding deceptive intent by the inventors. *See* Ex. 4 at 271:22-272:15. That leaves Marvell with no means of establishing deceptive intent except through the testimony of the inventors or other circumstantial evidence. Both inventors, however, testified that they did not intend to deceive the PTO. Specifically, Drs. Kavcic and Moura testified that they did not disclose the three references opined on by Dr. Proakis because they were cumulative of other cited references, failed to identify solutions for the problems solved by their own invention or otherwise were irrelevant. *See* generally pp. 13-20, *infra*. Drs. Kavcic and Moura also testified that they did not deliberately withhold the references that Marvell cites. There is no evidence disproving their testimony.

**III. SUMMARY JUDGMENT STANDARDS**

“Summary judgment is appropriate in a patent case, as in all other cases, when it is apparent from the entire record, viewed in the light most favorable to the non-moving party, that there are no genuine issues of material fact.” *Judkins v. HT Window Fashions Corp.*, 624 F. Supp. 2d 427, 434 (W.D. Pa. 2009). Summary judgment should be entered against a party “who fails to make a sufficient showing to establish the existence of an element essential to that party’s case, and on which that party will bear the burden of proof at trial.” *Id.* (citing and quoting *Celotex Corp. v. Catrett*, 477 U.S. 317, 322, (1986)). In deciding a summary judgment motion, a court must “view the evidence presented through the prism of the substantive evidentiary burden.” *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 254 (1986). Therefore, summary judgment should be granted—and Marvell’s inequitable conduct defense and counterclaims should be dismissed—if Marvell does not come forward with evidence from which a reasonable trier of fact could find

that **both** prongs of the inequitable conduct test are met: materiality and deceptive specific intent. *See Carnegie Mellon Univ. v. Marvell Tech. Group, Ltd.*, 2011 WL 4527353 at \*3 (W.D. Pa. Sept. 28, 2011) (Fischer, J.) (“[A] Court must enter summary judgment against a party who fails to make a showing sufficient to establish the existence of an element essential to that party's case, and on which that party will bear the burden of proof at trial.”) (all internals omitted). Since *Therasense* was decided, courts routinely have granted summary judgment dismissing inequitable conduct claims. *See, e.g., Carl Zeiss Vision Int’l GmbH v. Signet Armolite, Inc.*, 2011 WL 6372785 at \* 5-\*7 (S.D. Cal. Dec. 19, 2011); *Seiko Epson Corp. v. Glory South Software Mfg., Inc.*, No. 3:06-CV-477-BR, 2011 WL 5554373, at \*1 (D. Or. Nov. 15, 2011); *MeadWestvaco Corp. v. Rexam PLC*, 809 F.Supp. 2d 463, 472-73 (E.D. Va. 2011).

#### IV. ARGUMENT

##### A. The Allegedly Withheld References Were Not “But-For” Material to Patentability of the CMU Patents

*Therasense* requires “but-for” materiality. In other words, inequitable conduct exists only where there is **clear and convincing** evidence that a patent would not have issued had the reference been disclosed. *See Therasense*, 649 F.3d at 1291.<sup>5</sup> Marvell cannot establish materiality as a matter of law for at least two reasons.

**First**, “but-for” materiality does not exist as a matter of law where the PTO considered the

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<sup>5</sup> In *Therasense*, the Federal Circuit sitting *en banc* held that a party asserting inequitable conduct must “prove both elements—intent and materiality—by clear and convincing evidence,” 649 F.3d at 1287. It also explained that when determining materiality “the court should apply the [PTO’s] preponderance of the evidence standard” set forth in MPEP § 706 to determine “whether the PTO would have allowed the claim if it has been aware of the undisclosed reference.” *Id.* at 1291-92. Thus, Marvell’s burden is to show—by clear and convincing evidence—that the PTO would have “blocked patent issuance” when it applied the preponderance of the evidence standard articulated in MPEP § 706. *Id.* at 1292-93. Recently, a three-judge panel issued an opinion that omitted the initial, “clear and convincing” portion of the *Therasense* inquiry. *Aventis Pharma S.A. v. Hospira, Inc.*, \_\_\_ F.3d \_\_\_, 2012 WL 1155716, at \*7 (Fed. Cir., April 9, 2012). That omission cannot change *Therasense*’s holding because a panel cannot modify an *en banc* holding. *See e.g., Tate Access Floors, Inc. v. Interface Architectural Resources, Inc.*, 279 F.3d 1357, 1366 (Fed. Cir. 2002). Ultimately, this Court need not decide the appropriate standard; Marvell cannot demonstrate materiality under either standard.

allegedly withheld references during prosecution of the patents in question, regardless whether the inventor submitted the reference or the examiner found the reference on his/her own. *See e.g., Molins*, 48 F.3d at 1185.

**Second**, undisclosed references that are “cumulative” to information already before the PTO are not material as a matter of law and cannot support an inequitable conduct claim. *See e.g., Honeywell Int’l Inc.*, 488 F.3d at 1000; *Metso Minerals, Inc. v. Powerscreen Int’l Distribution Ltd.*, \_\_\_ F.Supp.2d \_\_\_, 2011 WL 6225371 at \*8 (E.D.N.Y. Dec. 8, 2011) (accused infringer cannot meet “but-for” materiality standard where undisclosed prior art reference is cumulative of other information before the PTO) (citing *Honeywell*); *Elan Microelectronics Corp. v. Apple, Inc.*, 2010 WL 3069322, at \*2–\*3 (N.D. Cal. Aug. 4, 2010) (same). Consequently, Marvell cannot meet the “but-for” materiality requirement of its inequitable conduct claim and summary judgment should be entered against Marvell for this reason alone.

CMU demonstrates below that none of the above three (3) references meets the “but-for” materiality test. The undisputed facts show that the PTO would have allowed the claims of the CMU patents even if the three references at issue had been before the PTO.<sup>6</sup>

### **1. The “Quantum Work”**

As Prof. Proakis admits, it is undisputed that the disclosure of the Quantum/Knudson patent is identical to the “Fitzpatrick patent,” which the PTO considered during the examination of both CMU patents. *See* Ex. 2 (Quantum/Knudson patent); Ex. 3 (Fitzpatrick patent); Exs. 12 and 13 (listing the Fitzpatrick patent under “References Cited”); Ex. 4 at 276-277; Ex. 1 at ¶ 250 (the Quantum/Knudson patent “contains an identical description to a patent [the Fitzpatrick patent] used by the Patent Office” and the two patents have “the very same disclosure”). Thus, as a matter of

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<sup>6</sup> Marvell’s expert, Dr. Proakis, admitted that the Group II claims are valid even over the allegedly withheld references. *See* Ex. 4 at 66-67. Thus, none of this prior art is “but-for” material to the Group II claims since none of this prior art would have prevented allowance of the Group II claims.

law, the Quantum/Knudson patent cannot satisfy the “but for” materiality standard because the PTO considered the identical disclosure in the form of the Fitzpatrick patent when it examined and allowed both CMU patents. *See* Ex. 4 at 278:8-14 (admitting that the claims of the CMU patents were “issued over” the Fitzpatrick patent); *see also* *Molins*, 48 F.3d at 1185; *Glaverbel S.A. v. Northlake Marketing & Supply, Inc.*, 45 F.3d 1550, 1557 (Fed. Cir. 1995) (no failure to disclose material information where a British patent was considered by the PTO that was “essentially identical, except for the claims” to an undisclosed, counterpart U.S. patent).

Dr. Proakis’ failure to render an opinion that the Quantum Work invalidated any of the Group I or II claims under either §§ 102 or 103 provides a second reason why that reference cannot serve as the basis for an inequitable conduct claim. *See* Ex. 1. Because there is no opinion that the Quantum Work anticipates or renders obvious a claim of the CMU patents, there is no basis upon which the Court can conclude that it meets the “but-for” test.<sup>7</sup>

## 2. The “IBM Work”

The Eleftheriou ’96 paper cannot satisfy the “but for” materiality standard because: (1) Marvell’s two experts, Drs. Proakis and Blahut, admitted that the Eleftheriou ’96 paper is essentially the same as the Coker/Eleftheriou ’766 patent (Ex. 6) that the PTO in fact considered during the prosecution of the CMU ’180 patent; and (2) the Eleftheriou ’96 paper is cumulative of the Chevillat/Eleftheriou ’415 patent (Ex. 7) and the ’92 Chevillat/Eleftheriou paper (Ex. 8), both of which the PTO considered during its examination of the CMU patents.

It is undisputed that the PTO considered the Coker/Eleftheriou ’766 patent during the examination the ’180 patent and that it issued all claims of the ’180 patent over the

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<sup>7</sup> By including the Quantum Work in his inequitable conduct opinion without also identifying it as invalidating art, Dr. Proakis demonstrated that he did not use the “but-for” materiality test when he provided his opinions. Indeed, Dr. Proakis’ deposition testimony on the definition of materiality that he applied did not refer to the “but-for” materiality test required by *Therasense*. *See* Ex. 4 at 271-75.

Coker/Eleftheriou '766 patent. *See* Ex. 13 (the '180 patent); Ex. 4 at 152-155. There are undisputed connections between the Eleftheriou '96 paper and the Coker/Eleftheriou '766 patent. The two authors of the Eleftheriou '96 paper are two of the four inventors on the Coker/Eleftheriou '766 patent, and both references concern noise predictive detectors. *See* Exs. 5-6. More importantly, Dr. Proakis' testimony provides a crucial (and undisputed) link between the two, demonstrating conclusively that the Eleftheriou '96 paper is cumulative to the Coker/Eleftheriou '766 patent as a matter of mathematics.

Specifically, Dr. Proakis cited equations (4) and (5) of the Eleftheriou '96 paper as the basis for his assertion that that paper invalidates the Group I claims. *See* Ex. 15. During his deposition, however, Dr. Proakis admitted that equations (4) and (5) of the Eleftheriou '96 paper are "mathematically equivalent" to equations (4) and (5) of the Coker/Eleftheriou '766 patent. *See* Ex. 4 at 138-141. CMU's witnesses agree. *See* Ex. 16 at ¶¶ 38, 127; Ex. 9 at 430:5-431:24. Even Marvell's other technical expert, Dr. Richard Blahut, admitted that the Coker/Eleftheriou '766 patent and the Eleftheriou '96 paper are "the same technologies." Ex. 10 at 331:13-18. Accordingly, as a matter of law and logic, the Eleftheriou '96 paper cannot qualify as "but-for" material prior art with respect to the '180 patent because it issued over the identical Coker/Eleftheriou '766 patent.

Marvell cannot take solace in the fact that the PTO considered the Coker/Eleftheriou '766 patent with respect to the '180 patent but not the '839 patent. The Group I claims of the '180 patent (claims 1 and 2) are broader than the Group I claims (claims 1-5) of the '839 patent, so the Eleftheriou article cannot meet the "but for" materiality test for the Group I claims of the '839 patent.<sup>8</sup> For example, claim 1 of the '180 patent is *broader* than claim 2 of the '839 patent

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<sup>8</sup> Dr. Proakis admits that the Group II claims are in fact valid over the Eleftheriou '96 paper (Ex. 4 at 66), so his materiality opinion is necessarily limited to the Group I claims.

because claim 2 of the '839 patent is limited to a "Viterbi-like detector," whereas claim 1 of the '180 patent applies more broadly to "a detector." See Ex. 4 at 156 ("I answered that the detector is – in Claim 1 [of the '180 patent], is a much broader term, and it encompasses different types of detectors.")<sup>9</sup> Because the *broader* claims of the '180 patent issued over the Coker/Eleftheriou '766 patent, the *narrower* Group I claims of the '839 patent also would have issued over the Coker/Eleftheriou '766 patent. See *In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988) (if a broader, e.g., independent, claim is nonobvious, a narrower, e.g., dependent, claim is necessarily nonobvious).<sup>10</sup>

Equations (4) and (5) of the Eleftheriou '96 paper also are mathematically equivalent to equations in the Chevillat/Eleftheriou '415 patent (Ex. 7), which the PTO considered when examining *both* of the CMU patents. See Ex. 12 at 1 (showing that the PTO considered the Chevillat/Eleftheriou '415 patent); Ex. 13 at 1 (same); see also Ex. 16 at ¶¶ 59, 131-132 (showing, with respect to the Group I claims, correspondence between equation (11) of the Chevillat/Eleftheriou '415 patent and equation (4) of the Eleftheriou '96 paper, and between equation (20) of the Chevillat/Eleftheriou '415 patent and equation (5) of the Eleftheriou '96 paper). Dr. Proakis could not dispute Dr. McLaughlin's conclusions on this point.<sup>11</sup>

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<sup>9</sup> The broader scope of claim 1 of the '180 vis-à-vis claims 1-5 of the '839 patent is further confirmed by looking at dependent claim 5 of the '180 patent which reads:

5. The method of claim 1 wherein the detector is selected from a group consisting of a *Viterbi detector*, a soft output Viterbi detector, a *Generalized Viterbi detector*, and a BCJR detector.

Ex. 13, '180 patent at claim 5 (emphasis added).

<sup>10</sup> The fact that the '839 patent would have issued over the Coker/Eleftheriou '766 patent (and, *a fortiori*, the Eleftheriou '96 paper) is further reinforced by the fact that during the prosecution of the '180 patent the examiner objected to the claims of the '180 patent on the grounds that they were "not patentably distinct" from claims 1, 4, 11-19, and 27-28 of the '839 patent. See Ex. 17 at 0100-0104. CMU overcame that objection by filing a terminal disclaimer such that the term of the '180 patent did not extend beyond the expiration of the '839 patent. See *id.* at 0121.

<sup>11</sup> At his deposition, more than five (5) weeks after CMU served Dr. McLaughlin's rebuttal report, Dr. Proakis was unprepared and unable to comment on the similarity between the references. See Ex. 4 at 216-223.

Finally, the Eleftheriou '96 paper teaches the same approach for addressing correlated noise as the '92 Chevillat/Eleftheriou paper (Ex. 8) that Drs. Kavcic and Moura also submitted to the PTO.<sup>12</sup> See Ex. 12 at 1; Ex. 13 at 1. As Dr. McLaughlin explained, the Chevillat/Eleftheriou '92 paper discloses a Viterbi detector that computes branch metric values using multiple time variant signal samples but no predictor coefficients (tap weights) that are different for different branches at a time instance of the trellis, just like equation (4) of the Eleftheriou '96 paper. See Ex. 16 at ¶¶ 128-132. Likewise, Dr. Proakis conceded the similarity between detectors of the '92 Chevillat/Eleftheriou and the '96 Eleftheriou papers, confirming Dr. Kavcic's view that the IBM authors merely "recycle[ed] the same branch metric idea for a number of years . . . ." Ex. 9 at 320:1-5. In particular, Dr. Proakis characterized the detectors in both papers as describing a Viterbi detector used with a partial response equalizer followed by a predictor that whitens the noise using predictor coefficients (i.e. a configuration of tap weights). See Ex. 4 at 192:13-194:13 (discussing the Chevillat/Eleftheriou '92 paper) and 67:7-72:13 (discussing the Eleftheriou '96 paper).

In sum, the Eleftheriou '96 paper is the same as the Coker/Eleftheriou '766 patent and is cumulative of the Chevillat/Eleftheriou '415 patent and the '92 Chevillat/ Eleftheriou paper, all of which the PTO considered during examination of the CMU patents. Because the PTO allowed the CMU patents over those references, Marvell cannot demonstrate that the Eleftheriou '96 paper is material under the "but-for" test.

### 3. **The Barbosa SPIE paper**

The Barbosa SPIE paper does not satisfy the "but-for" materiality standard because it also is cumulative of other references that the PTO considered during examination of the CMU patents. *All* of the Group I claims require that the selected branch metric functions be applied to a

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<sup>12</sup> Dr. Eleftheriou is a co-author of the '92 Chevillat/Eleftheriou paper. See Ex. 8

“*plurality* of signal samples....”<sup>13</sup> Confirming Dr. McLaughlin’s opinion (Ex. 16 at ¶¶ 42-44), Dr. Proakis twice testified that the branch metric function used in the Barbosa SPIE detector only uses a *single signal sample* to compute branch metric values and consequently “*rules out treating correlated noise....*” See Ex. 4 at 172-177 (emphasis added); *id.* at 293. Thus, the Barbosa SPIE paper is, at best, cumulative of other prior art that uses only a single signal sample to compute a branch metric value, such as the variance-dependent branch metrics of the Zeng-Moon (Ex. 14) and Lee-Cioffi (Ex. 18) papers.

The PTO considered the Zeng-Moon and Lee-Cioffi papers during the prosecution of both CMU patents. Indeed, the inventors even described those papers in the background section of the CMU patents, stating that they “derived a branch metric computation method for combating the signal dependent character of media noise,” but that they “ignore the correlation between noise samples.” See *e.g.*, Ex. 12 at col. 1:41-52. The CMU patents also recite the branch metric from those papers at equation (10). See *e.g.*, Ex. 12 at col. 6: 15-35; see also Claim Construction Opinion [Dkt. 175] at 12 (“The variance dependent metric, however, still has its correlation length set to zero, that it does not take into account noise from other signal samples.”).

Just like the Zeng-Moon and Lee-Cioffi papers, the Barbosa SPIE paper “rules out treating correlated noise.” Ex. 4 at 176:6-177:4. Further, Dr. Proakis’s report contains no opinions that the Barbosa SPIE paper is more material than the Zeng-Moon and Lee-Cioffi papers. Thus, even if the Barbosa SPIE paper addresses signal dependent noise, it ignores the correlation between noise samples and, therefore, is at best cumulative of the Zeng-Moon and Lee-Cioffi papers, which the PTO considered. See Ex. 16 at ¶138. Consequently, the Barbosa SPIE paper is not “but-for” material. See *Honeywell*, 488 F.3d at 1000 (cumulative references are not material).

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<sup>13</sup> For example, claim 1 of the ‘839 patent requires that each of the branch metric functions selected at a time instance of the trellis be applied to a “plurality of signal samples... wherein each sample corresponds to a different sampling time instant.”

**B. Marvell Cannot Prove That the Inventors Drs. Kavcic and Moura Had the Specific Intent To Deceive the PTO**

In addition to its inability to establish materiality, Marvell cannot prove (as it must) that the inventors made a deliberate decision to withhold known, material prior art. *See Therasense*, 649 F.3d at 1290. Negligence, gross negligence, or a showing that the patentee “should have known” of materiality is insufficient to satisfy the intent prong. *Id.* Nor may intent be inferred solely from a high degree of materiality. *Id.* In *Therasense*, the Federal Circuit expressly rejected the “sliding scale” that previously had allowed district courts to overcome a weak showing of intent by a strong showing of materiality, or vice versa. *Id.* While it is permissible to infer intent from circumstantial evidence, it is only appropriate to do so where a specific intent to deceive is “the single most reasonable inference able to be drawn from the evidence.” *Id.* at 1290-91. “Indeed, the evidence ‘must be sufficient to **require** a finding of deceitful intent in the light of all of the circumstances.’ Hence, when there are multiple reasonable inferences that may be drawn, intent to deceive cannot be found.” *Id.* at 1290-91 (emphasis in original). In other words, to avoid summary judgment, Marvell must come forward with evidence sufficient to demonstrate that the reasons given for not citing a particular reference are not “plausible.” *AstraZeneca Pharm. LP v. Teva Pharm. USA, Inc.*, 583 F.3d 766, 777 (Fed. Cir. 2009).<sup>14</sup>

Marvell cannot come forward with any evidence, let alone clear and convincing evidence, that satisfies this high standard. Among other things, Marvell cannot show that Drs. Kavcic’s and Moura’s reasons for not disclosing the references at issue were implausible, so it cannot show that an intention to deceive the PTO is “the single most reasonable inference able to be drawn” and that the evidence “**require[s]** a finding of deceitful intent in the light of all of the circumstances.”

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<sup>14</sup> *AstraZeneca* was decided before *Therasense*, but *AstraZeneca* remains binding precedent because it correctly applied the test for deceptive intent articulated in *Star Scientific*, 537 F.3d at 1365 (Fed. Cir. 2008) and *Kingsdown Med. Consultants, Ltd. v. Hollister Inc.*, 863 F.2d at 867, 876 (Fed. Cir. 1988) (en banc), which the Federal Circuit reaffirmed in *Therasense*, 649 F.3d at 1287, 1290-91, 1296.

*Therasense*, 649 F.3d at 1290; *see also AstraZeneca*, 583 F.3d at 777.

1. **The Inventors' Decision to Cite the Chevillat '92 Paper Rather Than the Follow-On Eleftheriou '96 Paper Does Not Compel a Finding of Deceptive Intent Regarding the Latter**

Marvell accuses Drs. Kavcic and Moura of deliberately deceiving the PTO by disclosing the '92 Chevillat/Eleftheriou paper discussed above, but not disclosing the Eleftheriou '96 paper. *See* Ex. 1 at ¶ 242. Marvell has no direct evidence to support that assertion and instead relies on the following circumstantial evidence:

- (1) Drs. Kavcic and Moura knew of the Eleftheriou '96 paper while the “‘839 and/or ‘180 patents were pending before the PTO” because they cited it in their January 2000 publication. *See* Ex. 1 at ¶ 241; and
- (2) The Eleftheriou '96 paper allegedly discloses “a[] modified branch metric for taking noise into account” not disclosed in the '92 Chevillat paper, and that disclosure allegedly was material to patentability. *See* Ex. 1 at ¶¶ 241-43.

These allegations fall well short of Marvell's obligation and, standing alone, are insufficient to satisfy Marvell's burden. *See Therasense*, 649 F.3d at 1290-91 (knowledge of a reference “does not prove specific intent to deceive”); *AstraZeneca*, 583 F.3d at 777 (“[i]ntent to deceive cannot be inferred simply from the decision to withhold [information] where the reasons given for the withholding are plausible”).

In fact, the evidence does not come close to establishing the requisite deceptive intent. The testimony of Drs. Kavcic and Moura—and the testimony of *Marvell's* expert Dr. Proakis—demonstrate that it was much more than “plausible” for Drs. Kavcic and Moura to believe that it was appropriate to cite the earlier '92 Chevillat/Eleftheriou paper (the original work by the IBM Group that authored all of the papers on the subject) and that the Eleftheriou '96 paper was cumulative of the '92 Chevillat/Eleftheriou paper.

Dr. Kavcic testified that he and Dr. Moura brought the '92 Chevillat/Eleftheriou paper — rather than the Eleftheriou '96 paper—to the attention of the patent office because the former paper is “a paper that has branch metrics . . . that account for some correlation, albeit in a non-signal-dependent fashion,” Ex. 9 at 312:19-23, and it “show[ed] that some way of handling *non-signal-dependent noise* existed.” *Id.* at 316:9-11 (emphasis added). Dr. Kavcic went on to explain that the earliest article of which he was aware from the IBM Group, which included “Eleftheriou and Hurt and Coker,” was the '92 Chevillat paper. *Id.* at 320:1-7. Dr. Kavcic considered the subsequent articles, including the Eleftheriou '96 paper, to be cumulative because they “were essentially saying the same things,” *id.* at 319:22-23, and they merely “recycle[d] the same branch metric idea for a number of years . . . .” *Id.* at 320:1-5.<sup>15</sup>

Although he does not have a specific recollection of why the '96 Eleftheriou article was not cited, Dr. Moura's testimony was consistent with Dr. Kavcic's testimony. Dr. Moura explained that professors typically cite the “source document” that first cited the idea in question rather than later derivative work:

Q: Can you tell us here today if you recall why you cited or why Professor Kavcic cited the old 1992 Eleftheriou work but not the recent 1996 work to the patent office in connection with your application that led to the '839 patent?

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<sup>15</sup> Dr. Kavcic's exact testimony was:

Q. Other than the Chevillat article –

...

Q. -- were you aware of other articles that took correlation into account in a detector in magnetic recording?

...

A. I was, but they were essentially saying the same thing.

Q. Okay. Which ones?

A. Well, the group by Chevillat, that's a group from IBM, started this line of articles. My earliest recollection -- the earliest article, based on my recollection, is 1992, but they kept recycling the same branch metric idea for a number of years, and the people who were in that group were Eleftheriou and Hurt and Coker, maybe others that --

Kavcic Dep. at 319:15-320:7.

...

A: I actually have a very simple answer for that question.

Q. Okay.

A. That has to do with the way professors are. Professors like to go to the sources. If you go to a paper and you recognize that there is a precedence, you might prefer to cite the present paper. So I'm speculating here, but I would say that we refer to whatever Chevillat's '92 [*i.e.* the 1992 Eleftheriou article] is, I would assume, because, in terms of what we address in our patent, okay, the key ideas that we address in our patent, I'm speculating that the key idea in Eleftheriou's paper was put forward in the '92 paper, so to give credit to where it's deserved, we may have chosen to refer to the '92 paper.

Ex. 19 at 148:25-149:23. Accordingly, Marvell cannot use the inventors' testimony to satisfy its burden of showing that the Drs. Kavcic and Moura "***made a deliberate decision*** to withhold a ***known*** material reference," *Therasense*, 649 F.3d at 1290 (emphasis in original), and that their reasons for not disclosing it were implausible. *See AstraZeneca*, 583 F.3d at 777.<sup>16</sup> Indeed, in similar circumstances, district courts applying the heightened intent standard discussed in *Therasense* and *AstraZeneca* have granted summary judgment dismissing inequitable conduct claims. *See, e.g., FURminator, Inc. v. Kim Laube & Co.*, 758 F.Supp.2d 797, 827-29 (E.D. Mo. 2010) (granting summary judgment of no inequitable conduct); *Carl Zeiss*, 2011 WL 6372785 at \* 5-\*7 (same).<sup>17</sup>

**2. Marvell Cannot Show that the Inventors Deliberately Withheld the Barbosa SPIE Paper with the Specific Intent to Deceive the PTO**

As with the Eleftheriou 96 paper, Marvell infers deceptive intent from the fact that Dr.

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<sup>16</sup> The fact that Marvell may "dispute[the inventors'] reasoning" (although it has offered no expert opinion or other evidence to the contrary) is not sufficient to establish "intentional withholding for the purpose of deceiving the examiner" and therefore not sufficient "to avert summary judgment" when the inventors have given plausible reasons for not disclosing the reference in question. *See AstraZeneca*, 583 F.3d at 777.

<sup>17</sup> *See also Medtronic Sofamor Danek USA, Inc. v. Nuvasive*, 2012 WL 474181 at \*5 (S.D. Cal. Feb. 14, 2012) ("[The inventor] provided credible testimony that he had no reason to hide [certain] publications from the PTO because [he] did not, and still does not, read them to disclose a translateral spinal implant as taught by the [patent-in-suit]...The record contains no evidence that [the inventor] had a specific intent to deceive the PTO by withholding [an] Article from the PTO during prosecution of the [patent-in-suit].").

Kavcic cited the Barbosa SPIE article in one of his publications but did not cite it to the PTO. *See* Ex. 4 at ¶¶ 245, 247. Marvell, however, has not, and cannot, adduce any evidence demonstrating the implausibility of the inventors' testimony that: (1) they believed the Barbosa SPIE paper was immaterial; and (2) they did not deliberately withhold this reference.

Dr. Moura repeatedly testified that he believed Barbosa SPIE was not material because it identified a problem but offered no solution:

Q: . . . Why didn't you cite Barbosa's work?

. . .

A. Actually, if we didn't cite Barbosa, it was by the simple reason that he actually pointed to a problem and then gave up on the problem . . .

Ex. 19 at 118:9-17; *see also id.* at 120:2-3 (“[Barbosa] identified the problem, but he essentially gave up on the problem”); *id.* at 125:25-126:5 (“Barbosa may have identified the problem, but . . . I don't recall Barbosa as even attempting to solve the problem but, rather, giving up on the problem.”). Dr. Kavcic likewise testified that he discussed one of the Barbosa references with Dr. Moura “all the time, and we decided that it revealed practically nothing that wasn't known before, and, certainly, it didn't reveal anything about our invention.” Ex. 9 at 310:9-13. Regarding Barbosa's work generally, Dr. Kavcic testified that “[i]n 1995 and 1996, we knew that *Barbosa had not done any work* that gave branch metrics – that disclosed *branch metrics that operated on plurality of signal samples so as to account for signal-dependent noise.*” *Id.* at 311:1-7 (emphasis added).

Indeed, Dr. Proakis confirmed the views of Drs. Kavcic and Moura regarding the Barbosa SPIE paper. Dr. Proakis admitted—twice—that the Barbosa SPIE paper does not teach the use of “a plurality of signal samples.” Ex. 4 at 172-177, 293. Given Dr. Proakis' admission, the explanation proffered by Drs. Kavcic and Moura for not citing Barbosa is more than just “plausible.” Accordingly, Marvell cannot prove deceptive intent for the Barbosa article as a

matter of law. See *Therasense*, 649 F.3d at 1291 (inequitable conduct claims must be dismissed unless the evidence is “sufficient to *require* a finding of deceitful intent”)(emphasis added); *AstraZeneca*, 583 F.3d at 777 (“[i]ntent to deceive cannot be inferred” when “the reasons given for the withholding are plausible”).

Indeed, Marvell’s arguments regarding the Barbosa references are similar to those recently rejected in *Multimedia Patent Trust v. The Walt Disney Co.*, Case No. 3:10-cv-00146-H-RBB, Dkt. No. 406 (S.D. Cal. Feb. 28, 2012) (attached), where the court granted summary judgment on the inequitable conduct claims because the only evidence of deceptive intent was that the inventor knew of the identified references but did not disclose them:

The fact that [the inventor] cited the Ericsson Article in his doctoral thesis is insufficient to show that he acted with a specific intent to deceive the patent office. *Therasense*, 649 F.3d at 1290 (“In a case involving nondisclosure of information, clear and convincing evidence must show that the applicant *made a deliberate decision* to withhold a *known* material reference.”) (emphasis in original). The Fox Defendants do not provide facts that support their conclusory allegations that [the inventor] intended to deceive the patent office by intentionally failing to disclose the Ericsson Article. *Id.* at 7.

*Id.*; see also *Accentra Inc. v Stales, Inc.*, \_\_\_ F.Supp.2d at \_\_\_, 2011 WL 7563039 at \*34 (C.D. Cal. Dec. 19, 2011) (dismissing inequitable conduct claim because the evidence did not support a finding that the inventors “withheld physical samples of the [prior art] staplers with the intent to deceive”).

3. **Marvell Cannot Show that the Inventors Deliberately Withheld the Quantum Work With the Specific Intent to Deceive the PTO**

Marvell’s final claim of inequitable conduct focuses on the Quantum/Knudson patent. Ex. 1 at ¶ 250. Marvell once again infers deceptive intent from the fact that Dr. Kavcic knew of the Quantum/Knudson patent (he requested a copy of it from the CMU library), but he did not cite it to the PTO. *Id.* Again, however, Marvell has not, and cannot, bring forward any evidence

disproving the testimony that the inventors believed the reference was immaterial and did not deliberately withheld that reference.

Dr. Kavcic provided the only testimony regarding intent with respect to the Quantum/Knudson patent. He testified that he does not “have any specific recollection why this particular [reference] was not cited . . . .” Ex. 9 at 401:2-4. Dr. Kavcic testified, however, that he did not cite the reference because he “probably deemed that it’s irrelevant,” *id.* at 401:22-23, because the it “reveals nothing that is found in our invention,” *id.* at 409:17-18.

Despite the Federal Circuit’s rejection of a sliding scale between materiality and intent in *Therasense*, Marvell argues that the evidence of a specific intent to deceive the PTO is Dr. Kavcic’s failure to disclose the Quantum/Knudson patent even though “the very same disclosure [i.e. the Fitzpatrick patent] was used to invalidate the originally filed Group 1 Claims.” Ex. 1 at ¶ 250. In addition to the inappropriate reliance upon the sliding scale, there are two clear problems with Marvell’s argument:

1. As a matter of law, the mere fact that the examiner rejected the original claims of the ‘839 patent over the Fitzpatrick patent does not demonstrate that the single most reasonable inference is that Dr. Kavcic specifically intended to deceive the PTO. *See Therasense*, 649 F.3d at 1290 (“[T]he fact that information later found material was not disclosed cannot, by itself, satisfy the deceptive intent element.”).

2. The evidence allows for the possibility (in fact, probability) that Dr. Kavcic read the Fitzpatrick patent, recognized that it was not a bar to patentability, and therefore did not submit it. Such an explanation is easily “plausible” because the PTO subsequently allowed the originally filed Group I claims of the ‘839 patent—over the identical Fitzpatrick patent—by allowing the broadest of the claims prosecuted and obtained by CMU, claims 1 and 2 of the ‘180

patent.<sup>18</sup> A position that the PTO vindicated cannot, as a matter of law, be implausible, and Marvell has therefore failed to meet its burden.

## V. CONCLUSION

Marvell cannot carry its heavy burden of proving inequitable conduct by CMU by clear and convincing evidence. Marvell cannot establish the necessary but-for materiality of the references upon which it relies. Nor can Marvell prove that Drs. Kavcic and Moura intentionally withheld certain references they knew to be material with the specific intent to deceive the PTO. Accordingly, CMU respectfully requests the Court grant summary judgment in its favor on Marvell's inequitable conduct claims.

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Respectfully Submitted,

/s Christopher M. Verdini  
Patrick J. McElhinny, Pa. I.D. # 53510  
patrick.mcelhinny@klgates.com  
Mark G. Knedeisen, Pa. I.D. # 82489  
mark.knedeisen@klgates.com  
Christopher M. Verdini, Pa. I.D. # 93245  
christopher.verdini@klgates.com  
K&L GATES LLP  
K&L Gates Center  
210 Sixth Avenue  
Pittsburgh, PA 15222  
Ph (412) 355-6500  
Fax (412) 355-6501

Douglas B. Greenswag (admitted *pro hac vice*)  
douglas.greenswag@klgates.com  
K&L GATES LLP  
925 Fourth Avenue, Suite 2900  
Seattle, WA 98104-1158  
Phone: 206.623.7580  
Fax: 206.623.7022

*Counsel for Plaintiff, Carnegie Mellon University*

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<sup>18</sup> See generally CMU's Post-Hearing Brief in Opposition to Marvell Defendants' Motion for Partial Summary Judgment of Invalidity of U.S. Patent Nos. 6,201,839 and 6,438,180 [Dkt. # 291], at 10-13 (explaining in detail that the original Group I claims rejected as unpatentable over Fitzpatrick '532 in the '839 patent were subsequently allowed in the '180 patent).

**CERTIFICATE OF SERVICE**

I hereby certify that on April 20, 2012 the foregoing was filed electronically. Notice of this filing will be sent to all parties by operation of the Court's electronic filing system. Parties may access this filing through the Court's system. Counsel includes:

John E. Hall  
jhall@eckertseamans.com  
ECKERT SEAMANS CHERIN & MELLOTT, LLC  
U.S. Steel Tower  
600 Grant Street, 44th Floor  
Pittsburgh, PA 15219

David C. Radulescu (admitted *pro hac vice*)  
david.radulescu@quinnemanuel.com  
QUINN EMANUEL URQUHART & SULLIVAN, LLP  
51 Madison Avenue  
22nd Floor  
New York, NY 10010  
Ph (212) 849-7000  
Fax (212) 849-7100

/s Christopher M. Verdini  
Christopher M. Verdini  
Pa. I.D. # 93245  
christopher.verdini@klgates.com  
K&L GATES LLP  
K&L Gates Center  
210 Sixth Avenue  
Pittsburgh, PA 15222  
Ph (412) 355-6500  
Fax (412) 355-6501