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UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

WESTERN DIVISION

The CALIFORNIA INSTITUTE OF TECHNOLOGY,

Plaintiff,

v.

HUGHES COMMUNICATIONS INC., HUGHES NETWORK SYSTEMS LLC, DISH NETWORK CORPORATION, DISH NETWORK L.L.C., and DISHNET SATELLITE BROADBAND L.L.C.,

Defendants.

Case No. 2:13-cv-07245-MRP-JEM

ORDER GRANTING IN PART AND DENYING IN PART PLAINTIFF'S MOTION FOR SUMMARY JUDGMENT

I. Introduction

Plaintiff California Institute of Technology ("Caltech") has asserted U.S. Patent Nos. 7,116,710 ("the '710 patent"), 7,421,032 ("the '032 patent"), 7,916,781 ("the '781 patent"), and 8,284,833 ("the '833 patent,") against Defendants Hughes Communications, Inc., Hughes Network Systems, LLC, DISH Network Corporation, DISH Network L.L.C., and dishNET Satellite Broadband L.L.C. (collectively, "Hughes"). The Court issued a claim construction order on August 6, 2014. *See Cal. Inst. of Tech. v. Hughes Commc'ns Inc.*, 35 F. Supp. 3d 1176 (C.D. Cal. 2014). The Court denied Hughes' motion for summary judgment for ineligibility under 35 U.S.C. § 101 on November 3, 2014. *See Cal. Inst. of Tech. v. Hughes Commc'ns Inc.*, No. 2:13-cv-07245, 2014 WL 5661290 (C.D. Cal. Nov. 3, 2014). Caltech now moves for summary judgment of infringement, no indefiniteness, no inequitable conduct, no laches, and no equitable estoppel. The Court grants Caltech's motion as to no indefiniteness and no equitable estoppel and denies Caltech's motion as to the other issues.

II. Background

The asserted claims are method and apparatus claims relating to error correction.[1] In modern electronic systems, data are stored in the form of bits having the value "1" or "0." During data transmission, a random or irregular fluctuation (known as noise) can occur in the signal and corrupt data. For example, a transmitter may send a bit with the value "1," but noise may corrupt this bit and cause the receiver to read the value as "0." To mitigate this problem, electronic systems use error correction. Error correction depends on redundancy, which refers to "extra" bits that may be duplicates of original information bits[2] and are transmitted along with the original bits. These extra bits are not necessary, in

[1] All four patents share a common specification and claim priority to the same patent application U.S. Serial Application No. 09/861,102.

[2] The '032 patent uses the term "message bits" rather than "information bits." This Court will generally use the term "information bits" when discussing error correction.

the sense that the original information exists without them, but they serve an important purpose. Using these extra bits, the receiver can ensure that the original information bits were not corrupted during transmission.

Caltech's patents are directed to a form of error correction code called an irregular repeat and accumulate ("IRA") code. An IRA code operates as follows: the code can introduce redundancy by repeating (i.e., duplicating) different original bits irregularly (i.e., a different number of times). These information bits may then be randomly permuted and combined to form intermediate bits, which are accumulated to form parity bits. Parity bits reflect the values of a selection of original information bits. These parity bits are transmitted along with the original information bits. The receiver ensures that the received original information bits were not corrupted during transmission. It can do this by modulo-2 adding the original information bits and parity bits.[3] The receiver knows whether this sum is supposed to be odd or even. If the sum is supposed to be odd but is instead even, the receiver will know that an error occurred and can perhaps correct the error using other information it has received.

The benefit of an IRA code is that not all bits are repeated the same number of times. The repetition of certain bits provides redundancy. Although greater repetition of every bit would allow for better error correction, it would also force the transmitter to send more bits, decreasing the coding rate and increasing data transfer time.[4] IRA codes balance competing goals: data accuracy and efficiency. The asserted claims recite generally encoding and decoding bits in accordance with an IRA code.

[3] For an explanation of mod-2 arithmetic, see *Modular Arithmetic – An Introduction*, Rutgers University, http://www.math.rutgers.edu/~erowland/modulararithmetic.html.

[4] Coding rate is calculated through the following equation: Coding Rate = (Original information bits) / (Original information bits + Extra bits). The closer the coding rate is to 1, the more efficient it is.

III. Standard for Summary Judgment

The Court shall grant summary judgment if there is no genuine dispute as to any material fact, as supported by facts on the record that would be admissible in evidence, and if the moving party is entitled to judgment as a matter of law. Fed. R. Civ. P. 56; *Celotex Corp. v. Catrett*, 477 U.S. 317, 322 (1986); *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 250 (1986). In order to grant summary judgment, the Court must identify material facts by reference to the governing substantive law, while disregarding irrelevant or unnecessary factual disputes. *Anderson*, 477 U.S. at 248. If there is any genuine dispute about a material fact such that a reasonable jury could return a verdict for the nonmoving party, summary judgment cannot be granted. *Id.* The Court must view facts and draw reasonable inferences in favor of the nonmoving party. *Scott v. Harris*, 550 U.S. 372, 378 (2007). If the party moving for summary judgment does not bear the burden of proof as to a particular material fact, the moving party need only give notice of the absence of a genuine issue of material fact so that the nonmoving party may come forward with all of its evidence. *See Celotex*, 477 U.S. at 325.

IV. Discussion

A. Infringement

The Court denies Caltech's motion as to infringement. There are two steps for determining infringement. "First, the asserted claims must be interpreted by the court as a matter of law to determine their meaning and scope." *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed. Cir. 1995). Then, "[i]n the second step, the trier of fact determines whether the claims as thus construed read on the accused product." *Id.* "[A]n accused product or process is not infringing unless it contains each limitation of the claim, either literally or by an equivalent." *Freedman Seating Co. v. Am. Seating Co.*, 420 F.3d 1350, 1358 (Fed. Cir. 2005). Infringement is a question of fact. *Brilliant Instruments, Inc. v. GuideTech, LLC*, 707 F.3d 1342, 1344 (Fed. Cir. 2013).

Caltech has moved for summary judgment of infringement for claims 1,18, 19, and 22 of the '032 patent and claims 16 and 19 of the '781 patent. As discussed in the Court's order striking portions of Stephen B. Wicker's expert report, Caltech's infringement contentions allege only literal infringement of the following fifteen products: HN9800 Satellite Router, HN9600 Satellite Router, HN9460 Satellite Router, HN9260 Satellite Router, HN7740S Broadband Satellite Router, HN7700S Satellite Router, HN7000 Satellite Modem, HX200 Broadband Satellite Router, HX50L Broadband Satellite Router, HX Gateway, HX90 Broadband Satellite Router, HX260 Mesh/Star Broadband Router, HX280 Mesh/Star Broadband Router, HX System TGW100, and Hopper Set-Top Satellite TV Box.[5] Caltech's infringement theory for these products is based only on the operation of the DVB-S2 standard. Thus, that theory of infringement is the only theory in the case and the only theory the Court will address.[6] Based on the language of the claims, Caltech cannot succeed in proving infringement for any of these claims at summary judgment.[7]

i. Caltech Cannot Prove Infringement of Claims 16 and 19 of the '781 Patent

Caltech cannot show that DVB-S2 technology performs "an accumulation of mod-2 or exclusive-OR sums of bits in subsets of the information bits," as required by the asserted '781 patent claims. The parties seem to agree on how the DVB-S2 technology works. The parties instead dispute the meaning of "sums of bits in subsets of the information bits," even though the parties stipulated to a construction: "the result(s) of adding together two or more information bits from

[5] For the disposition of DISH products involved in this case, see the Court's Order Granting in Part and Denying in Part Defendants' Motion for Summary Judgment.

[6] The Court, however, notes that even if the Comtech, Xilinx, and Gershwin components were at issue, these components also appear to be noninfringing.

[7] Indeed, it is difficult to see how Caltech could prove infringement of these claims if Hughes' factual allegations are accurate. Nonetheless, Caltech endorses many of Hughes' explanations of the technology.

the subset of information bits." The Court finds persuasive Hughes' argument that DVB-S2 does not perform this limitation.

The DVB-S2 standard does not accumulate "sums of bits in subsets of the information bits." DVB-S2 technology does not sum two or more bits that appear in a subset of information bits. DVB-S2 technology creates parity bits through a three-step process:

1. Parity bit accumulators are initialized to each have a value of 0.
2. Individual information bits are added recursively to the parity bit accumulators.[8]
3. The final values stored in the parity bit accumulators are themselves accumulated to generate parity bits.

To understand how this process works, imagine a parity bit accumulator with a value p_0. Imagine the accumulator is encoding a subset of information bits consisting of information bits i_1, i_2, and i_3. The following process would occur:

1. In the first step, the value of p_0 would be initialized to 0.
2. In the second step, three calculations would be performed. Initially, the parity bit accumulator would perform the following equation: $p_0 \oplus i_1 = p_1$. The value of p_0 is 0. If the value of i_1 were 1, the result of the equation would be $0 \oplus 1 = 1$. The new value of the parity bit accumulator would be p_1, which has a value of 1. The next equation the accumulator would perform is $p_1 \oplus i_2 = p_2$. The value of p_1 is 1. If the value of i_2 were 1, the result of this equation would be $1 \oplus 1 = 0$. After this equation, the value of the parity bit accumulator is p_2, which has a value of 0. The accumulator's next (and final) equation would be $p_2 \oplus i_3 = p_3$. The value of p_2 is 0. If the value of i_3 were 0, the final value of the parity bit accumulator (p_3) would be $0 \oplus 0 = 0$.

[8] The addition in this step is mod-2 addition. The symbol $\oplus$ denotes mod-2 addition.

3. Now, assume ten other parity bit accumulators were performing the same operation with different information bits. In the third step, the final values of these accumulators would be accumulated to generate parity bits.

This explanation illustrates that the accumulator never adds two information bits together. The accumulator never adds together, for example, i_1 and i_2. Instead, the accumulator sums i_1 and p_0 to generate p_1. The accumulator then sums p_1 and i_2. But p_1 is ***not*** an "information bit from the subset of information bits." Instead, p_1 is a newly created bit that does not appear in the original subset of information bits (i_1, i_2, and i_3). Given these facts, the procedure performed by DVB-S2 technology does not "[accumulate] mod-2 or exclusive-OR sums of bits in subsets of the information bits."

Caltech does not dispute the operation of the DVB-S2 standard. Moreover, Caltech does not dispute that in the above example, the accumulator would sum i_1 and p_0. Instead, Caltech argues that because p_0 equals 0, p_0 should not be considered as part of the accumulator's sum. Caltech bases this theory on the fact that "any value plus '0' yields the original value." Caltech's Reply in Supp. of Pl.'s MSJ at 3 n.6. Under Caltech's theory, the final sum of the accumulator is $i_1 \oplus i_2 \oplus i_3$. When presented in this manner, the accumulator appears to sum information bits with each other.

Caltech's theory is flawed. Practically speaking, Caltech is correct that in DVB-S2 technology, $p_0 \oplus i_1 \oplus i_2 \oplus i_3$ equals $i_1 \oplus i_2 \oplus i_3$. But the Court cannot disregard the initial summation of p_0 and i_1, even though $p_0 \oplus i_1$ has the same value as i_1 itself.[9] Caltech conveniently ignores an operation performed by the accumulator in order to construct a viable theory. In effect, Caltech is arguing that the DVB-S2's summing and accumulation operations are equivalent to the claim limitation. But in literal infringement analysis, this Court cannot ignore any

[9] It states the obvious to say two bits with the same value are not the same bit. For example, in the Court's above hypothetical, i_1 and i_2 both had the value 1, but they were different bits.

performed operation, and literal infringement is the only type of infringement before the Court. *See Cybor Corp. v. FAS Technologies, Inc.*, 138 F.3d 1448, 1467 (Fed. Cir. 1998) ("To prove literal infringement, the patentee must show that the accused device contains every limitation in the asserted claims.").

For these reasons, Caltech cannot show at summary judgment that the DVB-S2 standard infringes claim 16 or claim 19 of the '781 patent.

ii. Caltech Cannot Prove Infringement of Claims 1, 18, 19, and 22 of the '032 Patent

Caltech has not shown that DVB-S2 technology repeats information bits or that connections between information bits and parity bits are randomly chosen, as the asserted claims require.[10] *See Cal. Inst. of Tech.*, 35 F. Supp. 3d at 1191 ("[T]he Tanner Graph term is 'a graph representing an IRA code as a set of parity checks where every message bit is repeated, at least two different subsets of message bits are repeated a different number of times, and check nodes, randomly connected to the repeated message bits, enforce constraints that determine the parity bits.'"); '032 Patent, 8:16–17 (defining claim 1 term as "value of a sum of 'a' randomly chosen irregular repeats of the message bits"). Thus, the Court cannot grant summary judgment of infringement for the '032 patent's asserted claims.

The DVB-S2 standard does not appear to require repetition of bits. Instead, the DVB-S2 standard calls for the reuse of a single information bit in the creation of multiple parity bits, as shown in the DVB-S2 documentation. *See* First Decl. of Dr. Stephen B. Wicker ¶ 150; Defs.' Opp'n to Caltech's MSJ at 16–17. Caltech claims that this process does repeat bits, because multiple parity bits incorporate the value of a single information bit. This theory is incorrect.

Caltech's theory is based on the erroneous belief that the Court's construction of repeat does not require "concurrently storing multiple copies of the bits in

[10] Hughes also argues that the DVB-S2 technology does not receive a "data stream." This argument may have merit, but the Court will require further briefing on the construction of "data stream" before deciding this issue.

memory." First Wicker Decl. ¶ 156. The concept of a single bit contributing to multiple parity bits is a reuse of that bit, not a repeat of the bit. *See Cal Inst. of Tech.*, 35 F. Supp. 3d at 1184–88. The Court's claim construction order makes clear that "the plain meaning of 'repeat' requires the creation of new bits corresponding to or reflecting the value of the original bits." The Court's claim construction order further states, as an example, that "repeating a bit with the value 0 will produce another bit with the value 0." In order to repeat a bit, the technology must create a new copy of that bit. In order to create a new copy of a bit, the accused technology must store the new copied bit in memory. A copy of a bit simply does not exist unless it is stored in memory. *See id.* at 1184. Because the DVB-S2 standard does not require the repetition of bits, Caltech cannot show infringement of the '032 patent at summary judgment.

Caltech also cannot show infringement at summary judgment because there is a dispute regarding whether the DVB-S2 standard requires the information bits contributing to parity bits to be randomly chosen. The DVB-S2 documentation seems to assign specific information bits to contribute to specific parity bits. *See* Hantson Decl., Ex. F at CALTECH000001614–15, CALTECH000001632; *see also* Stark Reb. Rpt. ¶¶ 422–24. Hughes also points to a Hughes' technical document that contrasts a random code with the allegedly deterministic code involved in this case. *See* Hantson Decl., Ex. H at HUGHES 00049308; Stark Reb. Rpt. ¶¶ 431–33. This evidence creates a genuine dispute of this material fact.

For these reasons, the Court denies Caltech's motion for summary judgment as to infringement of the '032 patent.

B. Indefiniteness

The Court grants Caltech's motion as to no indefiniteness. Hughes argued during claim construction that claims 1 and 18 of the '032 patent and claims 1 and 8 of the '833 patent were indefinite. The Court concluded that the disputed terms were sufficiently definite. 35 F. Supp. 3d at 1189–94. The law of the case

doctrine precludes Hughes from relitigating this issue. *See Christianson v. Colt Indus. Operating Corp.*, 486 U.S. 800, 815–16 (1988) ("As most commonly defined, the doctrine [of the law of the case] posits that when a court decides upon a rule of law, that decision should continue to govern the same issues in subsequent stages in the same case." (internal quotation marks omitted)); *Moore v. James H. Matthews & Co.*, 682 F.2d 830, 833 (9th Cir. 1982) ("The 'law of the case' rule ordinarily precludes a court from re-examining an issue previously decided by the same court, or a higher appellate court, in the same case."); *see also Diamond Coating Technologies, LLC v. Hyundai Motor Am.*, No. 8:13-cv-01480, 2014 WL 5698445, at *4 n.2 (C.D. Cal. Aug. 25, 2014) (suggesting party must live with consequences of bringing early indefiniteness challenge at claim construction).

Hughes' argument for revisiting the issue is unconvincing. Hughes contends that *Teva Pharmaceuticals USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831 (2015), changed the law governing indefiniteness, and therefore, Hughes is not barred from raising the issue again. Hughes misunderstands *Teva*. *Teva* does not change how district courts decide indefiniteness. *Teva* holds only that an appellate court should review a district court's factual findings regarding extrinsic evidence for clear error, not de novo. *See id.* at 836–42. *Teva* does not alter the dominant role of intrinsic evidence in construing claims. *Id.* at 840–41 ("We recognize that a district court's construction of a patent claim, like a district court's interpretation of a written instrument, often requires the judge only to examine and to construe the document's words without requiring the judge to resolve any underlying factual disputes."); *see Cadence Pharm. Inc. v. Exela PharmSci Inc.*, 780 F.3d 1364, 1368 (Fed. Cir. 2015).

The Court was able to resolve the indefiniteness challenges based on the intrinsic evidence, and Hughes has offered the Court no reason to disturb a settled

issue.[11] Therefore, the Court grants Caltech's motion for summary judgment that the disputed claims are definite.

C. Laches

The Court denies Caltech's motion as to no laches. To invoke laches, the defendant must prove (1) that "the plaintiff delayed filing suit for an unreasonable and inexcusable length of time from the time the plaintiff knew or reasonably should have known of its claim against the defendant," and (2) that "the delay operated to the prejudice or injury of the defendant." *A.C. Aukerman Co. v. R.L. Chaides Const. Co.*, 960 F.2d 1020, 1032 (Fed. Cir. 1992). "Material prejudice to adverse parties resulting from the plaintiff's delay is essential to the laches defense. Such prejudice may be either economic or evidentiary." *Id.* at 1033. A presumption of laches attaches if the plaintiff delayed suit for more than six years. *Id.* at 1035. A court should consider any justification offered by the plaintiff for excusing the plaintiff's delay. *Id.* at 1033. "[A] district court must weigh all pertinent facts and equities in making a decision on the laches defense." *Id.* at 1034.

A number of factual disputes preclude summary judgment. First, the parties debate the date on which Caltech became aware of the alleged infringement. *See* Defs.' Opp'n at 43 (alleging Caltech may have been aware of potential infringement as early as 2003). If Caltech became aware of potential infringement in 2003, a presumption of laches would apply, and Caltech would have the burden to rebut one of the laches factors. *See Aukerman*, 960 F.2d at 1037–39. Second, Caltech is incorrect that *Meyers v. Brooks Shoe Inc.*, 912 F.2d 1459 (Fed. Cir. 1990), establishes a *per se* rule that patent prosecution excuses delay. In fact, the Federal Circuit noted in *Brooks Shoe* that "there are times when a patentee must bring suit before the expected issuance of the second of two related patents,"

[11] In any case, the more appropriate avenue for Hughes to revisit this issue was in a motion for reconsideration.

though the Federal Circuit concluded that the *Brooks Shoe* case was "not one of them." *Id.* at 1462. At the summary judgment stage, Caltech has not shown why this Court must conclude that Caltech's delay was reasonable. Third, Caltech cannot show at summary judgment that Hughes has not suffered evidentiary or economic prejudice. There are factual disputes over the extent of Hughes' investments in accused products in the period between when Caltech became effectively aware of the alleged infringement and Caltech's filing of the present lawsuit. Defs.' Opp'n at 44. There are also factual disputes over the effect of the delay on Hughes' ability to gather evidence. *Id.* at 43–44. These factual disputes individually and together prevent the Court from granting summary judgment on this issue.

D. Equitable Estoppel

The Court grants Caltech's motion as to no equitable estoppel. A defendant may assert equitable estoppel when

> (a) the patentee, through misleading conduct, leads the alleged infringer to reasonably infer that the patentee does not intend to enforce its patent against the alleged infringer. "Conduct" may include specific statements, action, inaction, or silence where there was an obligation to speak.
>
> (b) the alleged infringer relies on that conduct.
>
> (c) due to its reliance, the alleged infringer will be materially prejudiced if the patentee is allowed to proceed with its claim.

Meyers v. Asics Corp., 974 F.2d 1304, 1308 (Fed. Cir. 1992). Hughes has wholly failed to show any material disputed fact. Hughes' argument against summary judgment consists of conclusory statements stating that Hughes reasonably relied on the silence of Inforon (a licensee of patents-in-suit) and Caltech during the time after Inforon first gave Hughes notice of infringement. *See* Defs.' Opp'n at 44–45. These conclusory statements do not fulfill Hughes' burden "to make a showing sufficient to establish the existence of an element essential to that party's case."

Celotex, 477 U.S. at 322; *see Bryant v. Adventist Health Sys./West*, 289 F.3d 1162, 1167 (9th Cir. 2002) ("[A] conclusory statement that there is a genuine issue of material fact, without evidentiary support, is insufficient to withstand summary judgment."). As the Federal Circuit has noted, "silence alone will not create an estoppel unless there was a clear duty to speak, or somehow the patentee's continued silence reenforces the defendant's inference from the plaintiff's known acquiescence that the defendant will be unmolested." *Aukerman*, 960 F.3d at 1043–44 (citation omitted). Hughes has not put forth evidence showing that Caltech had a duty to speak or that Hughes had reason to infer that Caltech acquiesced in Hughes' allegedly infringing activity. Furthermore, Hughes has not pointed to specific facts demonstrating that Hughes relied on Caltech's silence. Finally, Hughes has shown no evidence that it would be prejudiced ***due to*** any reliance on Caltech's silence. In light of Hughes' failure to adduce any evidence to establish a prima facie case of equitable estoppel, the Court grants Caltech's motion as to this issue.

E. Inequitable Conduct

The Court denies Caltech's motion as to no inequitable conduct. To prove inequitable conduct, the defendant must show "by clear and convincing evidence that the patent applicant (1) misrepresented or omitted information material to patentability, and (2) did so with specific intent to mislead or deceive" the Patent and Trademark Office ("PTO"). *Am. Calcar, Inc. v. Am. Honda Motor Co.*, 768 F.3d 1185, 1188–89 (Fed. Cir. 2014) (internal quotation marks omitted). To prove materiality, the defendant must show that "prior art is but-for material," meaning that "the PTO would not have allowed a claim had it been aware of the undisclosed prior art." *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1291 (Fed. Cir. 2011). "Intent and materiality are separate requirements" and "a district court should not use a 'sliding scale,' where a weak showing of intent may be found sufficient based on a strong showing of materiality." *Id.* at 1290. Hughes alleges

that Caltech committed inequitable conduct when it failed to disclose the following references: (1) Luby, et al., "Practical Loss-Resilient Codes" (1997) ("Luby97"); (2) Luby, et al., "Analysis of Low Density Codes and Improved Designs Using Irregular Graphs" (1998) ("Luby98"); and (3) Richardson, et al., "Design of Provably Good Low-Density Parity Check Codes" (1999) ("Richardson").

Caltech puts forth various deficient arguments to demonstrate that Hughes cannot prove inequitable conduct for failure to disclose these references. To begin with, Caltech argues that it did disclose these references to the PTO on two occasions. Caltech cited to Luby97 and Richardson in presentation slides submitted as a provisional application. Caltech's Mem. in Supp. of MSJ at 27. Caltech also disclosed to the PTO an IRA codes paper, which cited the references. *Id.* Neither of these actions necessarily fulfills Caltech's duty to disclose this prior art to the PTO.[12] *Cf. Molins Plc v. Textron*, 48 F.3d 1172, 1184 (Fed. Cir. 1995) ("'[B]urying' a particularly material reference in a prior art statement containing a multiplicity of other references can be probative of bad faith."). As a practical matter, if courts adopted Caltech's bright-line rule, brief citations to prior art ***somewhere*** in a patentee's submission would satisfy the patentee's duty to the PTO. This rule would create a perverse incentive for patentees to bury harmful prior art in their filings, increasing administrative costs and the general burden on the PTO. The Court finds it significant that Caltech did not disclose these references in accordance with 37 C.F.R. § 1.56, which states that

> [t]he duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98.

[12] Caltech notes that the examiner indisputably reviewed a paper in which the references are cited, and therefore, the examiner must have reviewed the references. This Court cannot assume that the examiner reviewed every reference cited in a paper.

Caltech cannot dispute that it failed to disclose these references in accordance with §§ 1.97 and 1.98. There is at least a question of fact as to whether Caltech omitted these prior art references or misrepresented their relevance.

Caltech also argues that the references are not but-for material. There is a genuine dispute of fact on this issue. Hughes observes that during prosecution, the patentees distinguished their invention from the Wang prior art reference because Wang did not disclose irregular repetition of bits. While Wang does not disclose irregular repetition, the three references do disclose irregular repetition. Had the PTO considered these references, the PTO may have issued a rejection under § 103. Thus, Hughes may be able to show by clear and convincing evidence that Luby97, Luby 98, and Richardson would have prevented the PTO from granting the patents. At least at summary judgment, the Court cannot conclude that Hughes cannot establish materiality.

Finally, Caltech argues that Hughes cannot show specific intent that the patentees intended to deceive the PTO. But "direct evidence of deceptive intent is rare, [and] a district court may infer intent from indirect and circumstantial evidence." *Therasense*, 649 F.3d at 1290. Certainly, Caltech puts forth some evidence that the inventors lacked specific intent. For example, Caltech notes that the IRA codes paper describes the Luby references as showing that "on the binary erasure channel *irregular* LDPC codes can be decoded reliably." Caltech's Reply at 17 (internal quotation marks omitted). Caltech also notes that the IRA codes paper describes Richardson as showing that "irregular LDPC codes are markedly better than regular ones." *Id.* (internal quotation marks omitted). These statements may cut against a specific intent to deceive the PTO. On the other hand, Hughes sets forth evidence showing that the inventors appreciated the significance of Luby97, Luby98, and Richardson before the PTO proceedings commenced. Hughes also notes that inventors Aamod Khandekar and Hui Jin could not explain in their depositions why they failed to disclose the references to the PTO in

accordance with 37 C.F.R. § 1.56. In combination with Hughes' other observations, this evidence is enough to create a dispute of material fact regarding intent. Thus, factual disputes preclude Caltech's motion as to inequitable conduct.

V. Conclusion

The Court grants Caltech's motion for summary judgment as to no indefiniteness and no equitable estoppel. The Court denies Caltech's motion for summary judgment as to infringement, no inequitable conduct, and no laches.

IT IS SO ORDERED.

DATED: May 5, 2015

Hon. Mariana R. Pfaelzer
United States District Judge