UNITED STATES PATENT AND TRADEMARK OFFICE
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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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APPLE INC.,
Petitioner,

v.

CALIFORNIA INSTITUTE OF TECHNOLOGY,
Patent Owner.
_____

Case IPR2017-00219
Patent No. 7,116,710

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PATENT OWNER'S SURREPLY

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I. STATEMENT OF PRECISE RELIEF REQUESTED

In view of new argument and evidence submitted in Petitioner's Reply briefing, the Board (Papers 50, 52, 54) authorized a short sur-reply but prohibited submission of rebuttal evidence. The Reply materials are replete with untimely and improper new argument and evidence—including submission of new data, attorney-generated Tanner graphs, and a declaration from a new witness. The Reply (2) provides no reasonable justification for replacing Dr. Davis with a new witness. Dr. Davis was aware of his Fulbright commitment since at least February 2017 and he testified he remains available for deposition in the U.S. EX1056, ¶3. Accordingly, the Reply materials should be disregarded and given no weight.

II. ARGUMENT

A. Luby does not teach irregular repetition of information bits

The Petition presented the misguided theory that "the irregularity of Luby" could be incorporated into the RA codes by modifying Divsalar's repeater. *See, e.g.,* Pet. 37, 46. The POR explains, *inter alia*, that (1) the "irregularity of Luby" refers to a bipartite graph in which the <u>codeword</u> is irregular (repetition of information bits is a fundamendally different concept); (2) Divsalar's codeword already exhibits "irregularity of Luby"; and (3) modifying the repeater would not affect the codeword's irregularity. *E.g.*, EX2004 ¶¶84-86; POR 2, 19-26.

The Reply (1-3) asserts for the first time that Luby teaches irregular repetition of information bits. This is an improper shift away from the case in the

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petition. Moreover, the contention is wrong, relying on flawed analysis, wholly unsupported assumptions and a linguistic shell game to confuse the terminology.

First, Petitioner fails to acknowledge that its original expert Dr. Davis flatly conceded that Luby does not disclose irregular repetition of information bits. EX2033 196:2-198:15 (testifying, e.g., that a message node's degree "doesn't answer the question of whether that information bit is repeated or not").

Beyond that, the entire argument is based on the faulty assumption that "Luby's codewords contain 8,000 information bits and 8,000 parity bits." Reply 1. The statement is a conclusory and unexplained *nonsequitur* to the preceding citation to Luby, which refers neither to parity bits or information bits. And the Reply neglects to mention that Dr. Mitzenmacher (a co-author of Luby) specifically rejected the assertion at his deposition. EX1262 215:21-217:25; *see also*, EX2004 ¶77; EX1204, 256 ("We do not perform an actual encoding, but instead … use an initial message consisting entirely of zeroes."). To the extent the Reply is conflating "check bits" with "parity bits," Dr. Mitzenmacher explained this is erroneous. EX1262 216:25-217:21. Of course, the Reply forces Caltech and the Board to speculate as to the basis of its stated assumption since no reason for the conclusion is ever given. But the petitioner bears the unshifting burden of proof, and the entire argument collapses absent the unfounded assumption of 8,000 information bits in Luby's codeword.

The Reply (2-3) argues that Luby discloses irregular repetition because "a POSA [would] preferentially use higher degrees for information bits." Again, this relies on the erroneous assumption that Luby discloses codewords containing 8,000 parity bits and 8,000 information bits (see above).[1] And Dr. Mitzenmacher rebutted this hypothetical during his deposition, explaining that it would not be beneficial, and likely harmful, to preferentially resolve information bits relative to parity bits because the *entire* codeword must still be decoded. EX1262 232:25-233:22.

B. The attorney-generated graphs are erroneous and tainted with hindsight, and the corresponding argument unavailing

Divsalar's code already has variance in its codeword (*i.e.*, "the irregularity of Luby") and modifying Divsalar's repeater would have <u>no</u> effect on its codeword variance—this is plainly evident in the modified Khandekar graph in the petition. EX2004 ¶¶85-86; POR 28-29, 40-41. The Reply (3-5) offers no response on this point.[2] Besides repeating the same misguided assertion about changing the

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[1] The Reply (2-3) also confuses the terms "message bits" with "information bits." The "message bits" in Luby are different than information bits. EX2004 ¶76; EX2033 190:1-6; EX1264 152:20-153:6. Moreover, the whole notion of "preferential assignment" in the Reply argument is fundamentally at odds with Luby's "randomly choosen graphs." EX1204 249.

[2] The Reply (11) statement that accumulators were known is nonresponsive.

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