Paper No. ___
Filed: April 11, 2018

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

CALIFORNIA INSTITUTE OF TECHNOLOGY,
Patent Owner.

Case IPR2017-00701
Patent No. 7,421,032

PATENT OWNER'S SURREPLY

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I. INTRODUCTION

In view of new argument and evidence submitted in Petitioner's Reply briefing, the Board (Paper 43) authorized a short sur-reply but prohibited submission of rebuttal evidence. As illustrated in further detail below, the Reply materials are replete with untimely and improper new argument and evidence—including submission of newly generated experimental data, attorney-generated Tanner graphs and block diagrams, and a declaration from a new witness. The Reply provides no 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. EX1173, ¶3. Accordingly, the Reply materials should be disregarded and given no weight.

II. ARGUMENT

A. Petitioner's new argument that MacKay discloses nonuniform column weights for information bits should be rejected

As the POR explained, the petition failed to provide any evidence that MacKay discloses non-uniform column weights for information bits. POR 18-21. Having realized the flaws in its petition, Petitioner now relies on MacKay's Figures 5 and 6 to pivot to a new theory that MacKay discloses information bits appearing in a variable number of subsets. Reply 3-4. This is improper and should be rejected, not least because Caltech will not have an opportunity to rebut the argument with expert evidence. *Dell Inc. v. Acceleron, LLC*, 818 F.3d 1293, 1301

(Fed. Cir. 2016). Even then, Petitioner's new argument does not explain why Figures 5 and 6 would motivate a POSA to modify Ping's $\mathbf{H}^{\mathbf{d}}$ submatrix (they would not). MacKay presents Figures 5 and 6 as a way to achieve "fast encoding" by applying a "lower triangular structure" already found in Ping. EX1102 1453; EX1103 38. Moreover, MacKay's fast-encoding codes perform worse than the "ordinary-encoding codes" described earlier in the paper. EX1102, 1454, Fig. 7.

B. Petitioner failed to explain how Ping discloses Claim 6's LDGM

As explained in the POR (22), the petition does not provide any explanation for how Ping's $\mathbf{H}^{\mathbf{d}}$ submatrix would meet the definition of a generator matrix. Having recognized that deficiency, the Reply (6-7) attempts to explain how $\mathbf{H}^{\mathbf{d}}$ *could* be used as a generator matrix. This argument should be rejected as untimely. Moreover, it does not explain why a POSA *would* use $\mathbf{H}^{\mathbf{d}}$ as a generator matrix to implement Ping's equations.

C. No explanation for how to modify Ping to be non-systematic

POR (22-23) pointed out that the petition provided no rationale for modifying Ping's code to be non-systematic in view of Divsalar. The Reply does not address this deficiency. Instead, the Reply (8) now claims making Ping's code non-systematic would have been simple, citing to Dr. Frey's declaration (EX1165) at ¶29. Yet Dr. Frey's description is not a simple one, and he provides *zero* explanation for why a POSA would be motivated to make such changes.

Moreover, the Reply does not address the POR's argument that making Ping non-systematic would destroy Ping's code by removing the $\mathbf{H}^{\mathbf{d}}$ submatrix from the parity-check matrix. POR 23.

D. No motivation to combine Ping and MacKay

There is no motivation to modify Ping at least because its parity-check matrix is already irregular and MacKay does not teach selective application of uneven column weights to a submatrix. POR 24-29. The Reply's (8) response is that this argument should be rejected "for at least the reasons in the Petition and DI." But while the petition does not address the fact that Ping's parity-check matrix is already irregular (*see* POR 24-26), the Reply (9) *admits* that Ping's parity-check matrix already has nonuniform column weights of, *e.g.*, 4, 2, and 1.

The Reply does not dispute that setting Ping's "t" value to 9 shows a parity-check matrix that is more irregular than MacKay's. Rather, the Reply (9) falsely asserts that this example is "contrived," but Caltech's example of $\mathbf{H}^{\mathbf{d}}$ having column weights 9 was based on *Petitioner's proposal* to use column weights of 3 and 9 for Ping's $\mathbf{H}^{\mathbf{d}}$. Pet. 40; *see also* EX2033 229:4-9 ("[A]ny positive integer is a possibility"). PO's example simply adopts one of the weights proposed by Petitioner, while maintaining $\mathbf{H}^{\mathbf{d}}$'s uniform column weight, as instructed by Ping.

The Reply (10) absurdly asserts that it is improper to compare Ping's **H** matrix with MacKay's parity-check matrices. As Ping's **H** matrix is its parity-

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