Paper No. ___
Filed: May 9, 2017

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 PRELIMINARY RESPONSE PURSUANT TO 37 C.F.R. § 42.107

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I. INTRODUCTION

The Board should not institute *inter partes* review (IPR) on claims 1-10 of U.S. Patent No. 7,421,032 ("the '032 patent") because petitioner Apple Inc. ("Petitioner" or "Apple") has not met its burden of showing that it has a reasonable likelihood of prevailing on its proposed ground of unpatentability.

The petition fails to establish that the cited references teach or suggest the irregular repetition and permutation of message bits, as specifically recited in the claims. The cited references do not do so. The petition admits that the primary reference of Ping fails to disclose irregular repetition of message bits as claimed.[1] Petitioner attempts to cure this deficiency with MacKay, alleging one "would have been motivated to incorporate the irregularity disclosed in MacKay into Ping's code." Pet. at 37.

But Petitioner incorrectly equates the "irregularity" of MacKay and irregular repetition in the challenged claims. As acknowledged in the petition, MacKay defines "irregular codes" as codes "whose parity check matrices have nonuniform weight per column." Ex. 1102 at 1449; Pet at 32. By erroneously focusing on the buzzword "irregular" without adequately addressing the substance of the

[1] *See, e.g.*, Pet at 39 ("Ping's outer LDPC code is regular."); *see also*, Pet at 36 ("Divsalar teaches regular repeat-accumulate (RA) codes rather than irregular repeat-accumulate codes as described and claimed in the '032 patent.").

disclosure, the petition fails to recognize that the "irregularity" disclosed in MacKay is not the same as the irregular repetition of message bits as specifically recited in the challenged claims. MacKay's "parity check matrices [that] have nonuniform weight per column" are completely different than the irregular repetition of message bits, as claimed in the '032 patent.

Petitioner further fails to recognize that the "irregularity" described in MacKay is already present in Ping, and thus there would be no motivation for a person of ordinary skill to combine MacKay with Ping and such a combination would not lead to the invention claimed in the '032 patent. Ping discloses a code with a parity check matrix **H** that is composed of two submatrices, $\mathbf{H}^{p}$ and $\mathbf{H}^{d}$. But in arguing that Ping would benefit from the "irregularity" of MacKay, the petition improperly focuses only on submatrix $\mathbf{H}^{d}$, ignoring Ping's submatrix $\mathbf{H}^{p}$ and the parity check matrix **H** as a whole. Ping's parity check matrix **H**, however, already illustrates nonuniform weight per column. As such, Ping's parity check matrix already includes the "irregularity" of MacKay, thereby undermining Petitioner's proffered rationale for combining the references in the first place.

As such, the proposed grounds of challenge fail to demonstrate that each feature of claims 1-10 of the '032 patent is found in the cited art. Moreover, the rationale for combining the references is unsupported and is tainted by Petitioner's misapprehension of the reference disclosures.

Accordingly, institution of *inter partes* review should be *denied*.[2]

II. GROUND 1 FAILS

The petition fails to demonstrate that claims 1-10 would have been obvious over the combination of Ping in view of MacKay, Divsalar, and Luby97 as asserted in Ground 1 because not every limitation of the challenged claims is found in the

[2] Petitioner acknowledges that the'032 patent was already "challenged in one petition for *inter partes* review." Pet. at 3. The Board rejected this petition. *See Hughes Network Systems, LLC v. California Institute of Tech.*, Case No. IPR2015-00060, Paper 18 (Apr. 27, 2015). The earlier Hughes IPR similarly presented grounds based on Ping, Divsalar, and the Luby '909 Patent (U.S. Patent No. 6,081,909), the latter of which is similar in scope to the MacKay paper on which Petitioner relies in this instance. *Compare Hughes Network Sys.*, Case No. IPR2015-00060, Paper 4 at 42-56 (challenging claims 1, 8, 10, 18, 19, and 22 as obvious over combinations including Divsalar and Luby '909, some of which include Ping) *with* Pet. at 39-64 (challenging claims 1-10 as obvious over Ping, Divsalar, MacKay, and Luby97). Concurrent with the present petition, Petitioner filed two additional IPR petitions (IPR2017-00700 and IPR2017-00729) using Ping, Divsalar, and MacKay, and Luby97 as the primary references for each ground.

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