U.S. Patent No. 7,116,710 Apple v. California Institute of Technology

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC., Petitioner,

v.

CALIFORNIA INSTITUTE OF TECHNOLOGY, Patent Owner.

Case IPR2017-00219 Patent 7,116,710

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

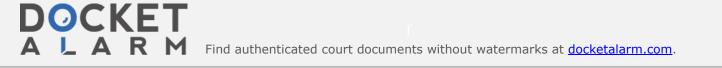


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I. INTRODUCTION

The Patent Owner Response ("POR") filed by Caltech fails to rebut Petitioner's showing that the challenged claims are unpatentable. First, Caltech mischaracterizes the teachings of Divsalar and Luby. Second, Caltech has failed to demonstrate secondary considerations of non-obviousness. Third, Caltech mischaracterizes the testimony of Petitioner's expert, Prof. Davis. Finally, Caltech's alleged pre-filing activity fails to antedate the Frey reference.

II. ARGUMENT

A. <u>The Challenged Claims are Obvious</u>

1. Divsalar in view of Luby renders claims 1-8 and 11-14 obvious

The POR relies on the same arguments that the Board preliminarily rejected—irregularity, partitioning, and combinability—and should reject again. POPR, 13-35; DI, 22.

i. Luby teaches irregular repetition of information bits

Caltech asserts that is unclear whether Luby's irregular message nodes result from irregular information bits, irregular parity bits, or both. *See* POR, 19-26. Caltech is mistaken.

Luby teaches that its codes have "rate ½ with 16,000 message bits and 8,000 check bits." Ex. 1204, 256. This means that each of Luby's codewords contain 8,000 information bits and 8,000 parity bits. Luby's Table 1 provides parameters for

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four codes. POR, 26. As Prof. Frey explains, the lambda values in Luby's table correlate to the number of nodes of each degree. The table below summarizes the percentages and total number of each type of message node for two codes in Table 1.

Code	Percentages of messages nodes of each degree		
22	Degree 5 Message Nodes: ~63% (~10,080 nodes)		
	Degree 6 Message Nodes: ~23% (~3,680 nodes)		
	Degree 27 Message Nodes: ~3% (~480 nodes)		
	Degree 29 Message Nodes: ~4% (~640 nodes)		
	Degree 30 Message Nodes: ~4% (~640 nodes)		
	Degree 100 Message Nodes: ~3% (~480 nodes)		
14'	Degree 3 Message Nodes: ~22% (~3,520 nodes)		
	Degree 4 Message Nodes: ~61% (~9,760 nodes)		
	Degree 21 Message Nodes: ~5% (~800 nodes)		
	Degree 23 Message Nodes: ~12% (1,920 nodes)		

Ex. 1265, ¶¶21-27.¹

Prof. Frey explains that in implementations of Luby's codes, the information bits would have different degrees. For example, in Luby's Code 22, some of the information bits would have degree 100 and others would have degree 30. Similarly, in Luby's Code 14', some of the information bits would have degree 23 and others would have degree 21. Ex. 1265, ¶28-29.

¹ After submitting his declaration, Dr. Davis relocated to Europe pursuant to a Fulbright Global Scholar Award. As a result, he was unavailable to work on the Reply. Petitioner's Reply is instead supported by the Declaration of Dr. Frey.

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