

DOCKET NO.: 1033300-00287

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT: 7,116,710

INVENTORS: HUI JIN, AAMOD KHANDEKAR, ROBERT J. MCELIECE

FILED: MAY 18, 2001

ISSUED: OCTOBER 3, 2006

TITLE: SERIAL CONCATENATION OF INTERLEAVED
CONVOLUTIONAL CODES FORMING TURBO-LIKE
CODES

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Apple Inc.
Petitioner

v.

California Institute of Technology
Patent Owner

Case IPR2017-00210

**PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 7,116,710
UNDER 35 U.S.C. § 312 AND 37 C.F.R. § 42.104**

TABLE OF CONTENTS

I. Mandatory Notices	3
A. Real Party-in-Interest	3
B. Related Matters	3
C. Counsel.....	4
D. Service Information.....	4
II. Certification of Grounds for Standing	4
III. Overview of Challenge and Relief Requested	4
A. Prior Art Patents and Printed Publications.....	5
B. Relief Requested	6
IV. Overview of the Technology.....	6
A. Error-Correcting Codes in General.....	6
B. Coding Rate.....	9
C. Performance of Error-Correcting Codes	10
D. LDPC Codes, Turbocodes, and Repeat-Accumulate Codes.....	11
E. Mathematical Representations of Error-Correcting Codes.....	14
F. Irregularity.....	19
V. The '710 Patent	21
A. Claims	21
B. Summary of the Specification.....	21
C. Level of Ordinary Skill in the Art.....	23
VI. Claim Construction	24
A. “close to one” (Claims 1 and 3).....	24
VII. Overview Of Primary Prior Art References.....	25
A. Frey.....	25
B. Divsalar	28
C. Luby97	31
D. Pfister	32
VIII. Grounds for Challenge.....	33

A. Ground 1: Claims 1 and 3 Are Anticipated by Frey34

B. Ground 2: Claims 1-8 and 11-14 Are Obvious Over Divsalar in View of Frey.....42

C. Ground 3: Claims 15-17, 19-22, and 24-33 Are Obvious Over Divsalar in View of Frey and Further in View of Luby9761

D. Ground 4: Claim 10 Is Obvious in View of Divsalar and Frey, and Further in View of Pfister73

E. Ground 5: Claim 23 Is Obvious in View of Divsalar, Frey, and Luby97, and Further in View of Pfister.....74

IX. Conclusion.....75

I. MANDATORY NOTICES

A. Real Party-in-Interest

Apple Inc. (“Apple” or “Petitioner”) and Broadcom Corp. are the real parties-in-interest.

B. Related Matters

U.S. Pat. No. 7,116,710 (the “’710 patent,” Ex. 1001) is assigned to the California Institute of Technology (“Caltech” or “Patent Owner”). On May 26, 2016, Caltech sued Apple, Broadcom Corp., and Avago Technologies, Ltd. in the U.S. District Court for the Central District of California, claiming that Apple products compliant with the 802.11n and 802.11ac wireless communication standards infringe the ’710 patent (and three others). On August 15, 2016, Caltech amended its complaint to assert patent infringement against Cypress Semiconductor Corp. *See* Amended Complaint, *California Institute of Technology v. Broadcom, Ltd. et al.* (Case 2:16-cv-03714), Docket No. 36. The ’710 patent was also asserted by Caltech against Hughes Communications Inc. in *California Institute of Technology v. Hughes Communs., Inc* (Case 2:13-cv-07245), and its claims were challenged in two petitions for *inter partes* review, IPR2015-00068 and IPR 2015-00067. Patents claiming priority to the ’710 patent were challenged in IPR2015-00060, IPR2015-00061, IPR-2015-00081, and IPR2015-00059.

C. Counsel

Lead Counsel: Richard Goldenberg (Registration No. 38,895)

Backup Counsel: Brian M. Seeve (Registration No. 71,721)

D. Service Information

Petitioner consents to electronic service.

E-mail: richard.goldenberg@wilmerhale.com

Post and Hand Delivery: WilmerHale, 60 State St., Boston MA 02109

Telephone: 617-526-6548

Fax: 617-526-5000

II. CERTIFICATION OF GROUNDS FOR STANDING

Petitioner certifies pursuant to Rule 42.104(a) that the patent for which review is sought is available for *inter partes* review and that Petitioner is not barred or estopped from requesting *inter partes* review on the grounds in this Petition.

III. OVERVIEW OF CHALLENGE AND RELIEF REQUESTED

Pursuant to Rules 42.22(a)(1) and 42.104(b)(1)-(2), Petitioner challenges claims 1-8, 10-17, and 19-33 of the '710 Patent ("the challenged claims") and requests that each challenged claim be canceled.

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.