

**UNITED STATES PATENT AND TRADEMARK OFFICE**  

---

**BEFORE THE PATENT TRIAL AND APPEAL BOARD**  

---

APPLE INC.,  
Petitioner,

v.

COREPHOTONICS, LTD.  
Patent Owner

---

IPR2018-01133  
U.S. Patent No. 9,538,152

---

**DECLARATION OF OLIVER COSSAIRT, PH.D.  
UNDER 37 C.F.R. § 1.68 IN SUPPORT OF PETITION  
FOR INTER PARTES REVIEW**

**TABLE OF CONTENTS**

I.	INTRODUCTION .....	1
II.	QUALIFICATIONS .....	2
III.	LEVEL OF ORDINARY SKILL IN THE ART .....	6
IV.	RELEVANT LEGAL STANDARDS .....	8
	A. Anticipation .....	8
	B. Obviousness.....	8
V.	THE '152 PATENT.....	10
	A. Summary of '152 Patent.....	10
	B. Prosecution History of the '152 Patent .....	14
VI.	CLAIM CONSTRUCTION .....	17
	A. “ <i>standard color filter array (CFA)</i> ” (claims 1 and 3).....	18
VII.	FOUNDATIONS .....	19
	A. Ground 1: Claims 1-4 are unpatentable under 35 U.S.C. § 103(a) over Border in view of Parulski .....	19
	1. Summary of Border.....	19
	2. Summary of Parulski.....	21
	3. Reasons to Combine Border and Parulski.....	23
	4. Claim 1 .....	25
	3. Claim 2 .....	68
	4. Claim 3 .....	71
	5. Claim 4.....	73
VIII.	DECLARATION.....	74

**I. INTRODUCTION**

1. I, Oliver Cossairt, have been retained by counsel for Apple Inc. (“Apple” or “Petitioner”) as a technical expert in connection with the proceeding identified above. I submit this declaration in support of Apple’s Petition for Inter Partes Review of U.S. Patent No. 9,538,152 (“the ’152 Patent”).

2. Compensation for my work in this matter is based on an hourly rate. In addition, reasonable and customary expenses associated with my work and testimony in this matter are reimbursed. This compensation is not contingent on the outcome of this matter, nor is it contingent on the specifics of my testimony. I have no personal or financial stake, nor any interest in the outcome of the present proceeding.

3. In the preparation of this declaration, I have studied:

- (1) The ’152 Patent, APPL-1001;
- (2) The prosecution file history of the ’152 Patent (’823 App), APPL-1002;
- (3) The prosecution file history of U.S. Provisional App. No. 61/730,570 (’570 App), APPL-1003;
- (4) U.S. Patent Application Publication No. 2008/0030592 to Border et al. (“Border”), APPL-1006;
- (5) U.S. Patent No. 7,859,588 to Parulski et al. (“Parulski”), APPL-1007;

(6) Ralph E. Jacobson et al., *The Manual of Photography: photographic and digital imaging*, 9<sup>th</sup> Edition, 2000 (“Jacobson”), APPL-1008;

(7) Michael Langford et al., *Langford’s Advanced Photography*, 7<sup>th</sup> Edition, 2008 (“Langford”), APPL-1009;

(8) Richard Szeliski, *Computer Vision: Algorithms and Applications*, 2011 (“Szeliski”), APPL-1010.

4. In forming the opinions expressed below, I have considered:

- (1) The documents listed above;
- (2) Any additional documents discussed below; and
- (3) My own knowledge and experience based upon my work in the fields of imaging systems as described below.

## II. QUALIFICATIONS

5. My qualifications and professional experience are described in my *Curriculum Vitae*, a copy of which can be found in exhibit APPL-1005. The following is a brief summary of my relevant qualifications and professional experience.

6. For more than 15 years, I have been developing professional and academic experience in the field of imaging systems. One of the major themes of my research has been directed to computational photography, which combines expertise in optics design and image processing. One of my focused research areas

is for leveraging optical designs and image processing together to enable new capabilities in conventional cameras, such as extended depth-of-field, digital refocusing, super-resolution, and measuring high dimensional appearance.

7. I earned my Bachelor of Science degree in Physics from Evergreen State College, Olympia, Washington, in 2001. In 2003, I earned my Master of Science degree in the Department of Media Arts and Sciences from Massachusetts Institute of Technology, Cambridge, Massachusetts.

8. From 2003 to 2006, I worked as an Optical and Software Engineer at Actuality Systems, Inc., Reading, Massachusetts. As part of this work, I managed a National Institute of Standards and Technology (NIST) Advanced Technology Program (ATP) research initiative to develop next generation 3D displays.

9. I received a Ph.D. in Computer Science from Columbia University, New York City, New York in 2011. My doctoral thesis focused on computational imaging, specifically tradeoffs and limits in computational imaging. After receiving the Ph.D., I continued my research in computational imaging as a Postdoctoral Researcher at Columbia University till June 2012.

10. Since 2012, I have been a professor in the Department of Electrical Engineering and Computer Science at the Northwestern University, Evanston, Illinois. I currently lead the Computational Photography Lab at Northwestern University, which develops imaging and display systems that combine a creative

# 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.