

**UNITED STATES PATENT AND TRADEMARK OFFICE**

---

**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

---

LOWE'S COMPANIES, INC.,  
LOWE'S HOME CENTERS, LLC AND L G SOURCING, INC,  
Petitioners

v.

NICHIA CORPORATION,  
Patent Owner

---

U.S. Patent No. 7,915,631

“Light Emitting Device and Display”

---

**DECLARATION OF DR. ERIC BRETSCHNEIDER  
IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S.  
PATENT NO. 7,915,631**

## TABLE OF CONTENTS

I.	BACKGROUND AND QUALIFICATIONS .....	1
II.	ASSIGNMENT AND MATERIALS REVIEWED .....	3
III.	STATE OF THE ART .....	8
A.	The Principles of Color Mixing.....	8
B.	Measuring Color .....	10
C.	In 1996, YAG Phosphors Were Well Known For Converting Blue Emissions To Yellow In Lighting Products.....	12
D.	Emergence of Commercially Viable Blue LEDs.....	21
E.	The Blue Plus Yellow Approach to Making A White LED was a Natural And Obvious Progression .....	23
F.	LED Controllers .....	25
IV.	THE ‘631 PATENT .....	26
A.	The ‘631 Patent Specification.....	26
B.	The ‘631 Prosecution History.....	28
V.	CLAIMS OF THE ‘631 PATENT .....	28
VI.	CLAIM CONSTRUCTION.....	31
A.	General Legal Standards.....	31
B.	Terms Requiring Construction .....	34
1.	“transparent material” .....	34
2.	“diffuses”.....	35
VII.	PATENTABILITY ANALYSIS .....	36
A.	Legal Standards for Patentability .....	36
B.	The Cited Prior Art.....	40
1.	Baretz .....	40
2.	Shimizu .....	40
3.	Matoba.....	41
4.	Pinnow .....	42

5.	Nakamura .....	43
C.	Ground 1: Baretz, Shimizu and Matoba Render Claims 1-2, 6, and 10-11 Obvious .....	44
b.	Baretz Discloses Claim 2 .....	60
c.	Baretz Discloses Claim 6 .....	60
d.	Baretz Discloses Claim 10 .....	60
e.	Baretz Discloses Claim 11 .....	61
D.	Ground 2: Baretz, Shimizu, Matoba, and Pinnow Render Claims 4 and 7-8 Obvious .....	61
1.	Baretz, Shimizu, and Pinnow Disclose Claim 4.....	62
2.	Pinnow Discloses Claim 7.....	70
3.	Pinnow Discloses Claim 8.....	71
E.	Ground 3: Baretz, Shimizu, Matoba, and Nakamura Render Claim 9 Obvious.....	71
a.	Nakamura Discloses Claim 9 .....	71
b.	A POSITA Would Have Been Motivated To Combine Baretz, Shimizu, Matoba, and Nakamura And Had a Reasonable Expectation of Success .....	72
F.	Ground 4: Matoba, Shimizu and Pinnow Render Claims 1, 4, 6- 8, and 10-11 Obvious .....	74
a.	Independent Claim 1 .....	75
b.	Matoba, Shimizu, and Pinnow Disclose Claim 4.....	88
c.	Matoba, Shimizu, and Pinnow Disclose Claim 6.....	89
d.	Matoba, Shimizu, and Pinnow Disclose Claim 7.....	89
e.	Matoba, Shimizu, and Pinnow Disclose Claim 8.....	89
f.	Matoba, Shimizu, and Pinnow Disclose Claim 10.....	90
g.	Matoba, Shimizu, and Pinnow Disclose Claim 11 .....	90
VIII.	CONCLUSION.....	90

I, Eric Bretschneider, do hereby declare and state as follows:

**I. BACKGROUND AND QUALIFICATIONS**

1. I have over 25 years of experience with lighting and LEDs, including a comprehensive background on the full range of LED production technologies, including MOCVD hardware/process, fabrication, LED chip and package testing and reliability, optical design, thermal management, color conversion, and SSL fixture/lamp design, integration, and reliability.

2. I am currently the Chief Technology Officer at EB Designs & Technology. In that capacity, I am (among other things) responsible for the design of solid-state lighting technologies for clients ranging from startups to Fortune 100 companies.

3. I am also currently a member of the University of Florida Department of Chemical Engineering Advisory Board. And I have been a Conference Chair for LED Measurement and Standards. I am also a member of a number of professional societies, including SPIE, Materials Research Society, Illuminating Engineering Society (I am a member of the Science Advisory Panel as well as a member of numerous committees, most notably the IES Test Procedures Committee where I chair the Solid-State Lighting subcommittee).

4. Prior to my position at EB Designs & Technology, I served as the Director of Engineering at HeathCo, LLC. In that capacity, I was responsible for advanced technology/product development related to solid state lighting, sensors,

notifications and control products.

5. Prior to my position as Director of Engineering at HeathCo, I was positioned at the Elec-Tech International Co., Ltd., where I held the positions of Chief Engineer, ETi Lighting Research Institute and VP of Research and Development, ETi Solid State Lighting. In that capacity, my responsibilities included developing all technology and product roadmaps for markets in North America, China, Europe, and Japan.

6. Between 2008 and 2011, I was positioned at Lighting Science Group Corp., first as a product development manager, and my responsibilities included developing solid state lighting products, then as VP of Research, and my responsibilities included developing advanced gdtgte LED models for product development and production control.

7. Between 2004 and 2008, I was positioned at Toyoda Gosei North America, where I was a sales manager, and my responsibilities included managing and developing LED die and package sales accounts form the eastern region of North America.

8. Between 2003 and 2004, I was positioned at Beeman Lighting, where I was Director of Solid State Lighting Engineering, and my responsibilities included leading development of solid state lighting systems and materials.

9. I have also authored and presented more than a total of 30 publications,

# 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.