

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CARL ZEISS SMT GMBH
Petitioner

v.

NIKON CORPORATION
Patent Owner

Case IPR2013-00362

Patent 7,348,575

PATENT OWNER'S RESPONSE TO THE PETITION

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Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

TABLE OF CONTENTS

I. Introduction..... 1

II. Overview of Catadioptric Projection Optical Systems..... 1

 A. Advances in Projection Optical Systems Occur Rapidly but in Small
 Increments 1

 B. The Race to Design a Projection Optical System for Immersion
 Lithography 5

 C. Zeiss Pursues Dioptric Solutions..... 5

 D. Nikon Pursues Catadioptric Solutions and Is First to Enable and Patent a
 Catadioptric Projection Optical System for Immersion Lithography 9

III. The 575 Patent 10

 A. Compact Projection Optical System..... 12

 B. Excellent Imaging Performance (Aberration Correction)..... 13

 C. Reflection Loss on Optical Surfaces 14

 D. Optical Beam Separation..... 14

IV. Level of Skill in the Art..... 15

V. Claim Construction..... 16

 A. Applicable Law..... 16

 B. Boundary lens 16

VI. Prior Art 18

 A. Terasawa 18

 B. Immersion References 19

 i. Suwa 19

 ii. Ulrich..... 21

 iii. Switkes 22

 iv. Fukami..... 24

VII.	The Prior Art Does Not Enable the Claimed Invention	25
A.	An Unpatentability Challenge Fails if Based on Prior Art Combinations That Do Not Enable the Claimed Invention.....	25
B.	Terasawa and the Immersion References Fail to Enable the Invention Claimed in the 575 Patent.....	26
VIII.	Mr. Juergens is Not an Expert in Projection Optical Systems	35
IX.	Independent Claim 1 is not Obvious	38
X.	Secondary Considerations	43
XI.	The Dependent Claims Are Not Obvious.....	47
XII.	Conclusion	47

TABLE OF AUTHORITIES

Beckman Instruments, Inc. v. LKB Produkter AB,
892 F.2d 1547 (Fed. Cir. 1989).....28

Broadcom Corp. v. Emulex Corp., 732
F.3d 1325 (Fed. Cir. 2013)42

Graham v. John Deere Co.,
383 U.S. 1 (1966).....46

In re Kumar,
418 F.3d 1361 (Fed. Cir. 2005)28

In re Translogic Tech., Inc.,
504 F.3d 1249 (Fed. Cir. 2007)19

In re Wands,
858 F.2d 731 (Fed. Cir. 1988)28, 34, 38

Kinetic Concepts, Inc. v. Smith & Nephew, Inc.,
688 F.3d 1342 (Fed. Cir. 2012)46

McGinley v. Franklin Sports, Inc.,
262 F.3d 1339 (Fed. Cir. 2001).....46

Power Integrations Inc. v. Fairchild Semiconductor Int'l Inc.,
711 F.3d 1348 (Fed. Cir. 2013)46

...

I. Introduction

On December 16, 2013, the Board ordered *Inter Partes* Review of U.S. Patent No. 7,348,575 (“the 575 Patent,” Ex. 1001), instituting review on the following grounds:

- 1) Claims 1-3, 8-12, 16-20, 23-26, 29, and 31-33 are obvious under 35 U.S.C. §103(a) over Terasawa in view of the Immersion References; and
- 2) Claim 30 as obvious under §103(a) over Terasawa in view of the Immersion References, and further in view of Asai. (Decision, Paper 10.)

For at least the reasons described below, the Board should confirm the patentability of claims 1-3, 8-12, 16-20, 23-26, and 29-33 of the 575 Patent.

II. Overview of Catadioptric Projection Optical Systems

A. Advances in Projection Optical Systems Occur Rapidly but in Small Increments

At the heart of the semiconductor development process is the lithographic step in which a projection optical system is used to expose a pattern image of a mask (or reticle) onto a wafer coated with a photo resist layer. In order to keep pace with the demand for higher and higher integration of semiconductor elements, the resolution of projection optical systems must improve. Moore's Law provides the observation that the number of transistors on integrated circuits doubles approximately every two years. (Ex. 2002 83.) This phenomenon of increasing

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