

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CARL ZEISS SMT GMBH
Petitioner

v.

NIKON CORPORATION
Patent Owner

Case IPR2013-00363

Patent 7,348,575

EXPERT DECLARATION OF DR. JOSE SASIAN

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

I. Introduction

1. My name is Jose Sasian. I have been retained by counsel for patent owner Nikon Corporation (“Nikon”) in the above captioned matter. I have been asked to consider and analyze the validity of U.S. Patent No. 7,348,575 (“the 575 Patent”). I have been specifically asked to consider whether certain prior art anticipates and/or renders obvious the invention claimed in claims 55-67 of the 575 patent (“the challenged claims”).

2. All statements made herein are, to the best of my knowledge, true. The opinions herein are my own.

3. I am being compensated at a rate of \$400 per hour, and my opinions set forth herein are not contingent upon or influenced by my compensation. I do not generate income from the sale of lithography products such as catadioptric projection lenses.

4. I understand that petitioner Carl Zeiss (“Zeiss”) submitted the declaration of Mr. Richard C. Juergens in support of their allegations that the challenged claims are unpatentable as anticipated and/or obvious over certain prior art references submitted with the petition.

5. In addition to the opinions set forth herein, I reserve the right to amend and/or supplement my opinions in response to any additional filings made

by Zeiss and/or Mr. Juergens, or in response to any other submissions made in this proceeding.

II. Expertise and Qualifications

6. My qualifications as an expert are included in my *curriculum vitae*, which is Nikon's Exhibit 2005.

7. I am currently a full-time, tenured Professor of Optical Sciences at the College of Optical Sciences at the University of Arizona in Tucson, Arizona, a position I have held since 2002. As a professor, I teach and conduct research in the field of optical design. For example, I teach my students how to design lenses and mirrors and how to think about light so that they can design useful optical systems. As part of my academic and research responsibilities, I am frequently involved with the design, fabrication, and testing of optical devices.

8. Prior to receiving tenure, I was an Associate Professor of Optical Sciences at the University of Arizona from 1995 to 2001. Prior to joining the University of Arizona faculty, I was a member of the technical staff with AT&T Bell Laboratories from 1990 to 1995. From 1984 to 1987, I was a Research Assistant, and from 1988 to 1990, I was a Research Associate, in the Optical Sciences Center at the University of Arizona. From 1976 to 1984, I was an optician at the Institute of Astronomy at the University of Mexico.

9. I received a Bachelor of Science degree in Physics from the University of Mexico in 1982, a Master of Science degree in Optical Sciences from the University of Arizona in 1987, and a Ph.D. degree in Optical Sciences from the University of Arizona in 1988. My research areas include optical design; fabrication and testing of optical instruments; astronomical optics; diffractive optics; opto-mechanical design; light in gemstones; lithography optics; and light propagation.

10. At the University of Arizona, I have taught the courses Lens Design OPTI 517 (1997-present), Advanced Lens Design OPTI 595A (2008, 2012), Illumination Optics Seminar (1997-2000), Introduction to Aberrations OPTI518 (2005-present), and Optical Shop Practices OPTI 597A (1996-present). I have directed several theses and dissertations in the areas of lens design. I have lectured regarding my work, and have published, along with students and colleagues, over one hundred scientific papers in the area of optics. These include technical papers, patents, thesis research done under my direction, related to optical design for optical lithography. For example,

- a. Lenny Laughlin, "Optical Source Modeling," M. Sc. Report, 2003.

- b. Tony Lin, M. Sc. “Lens Design Guidelines for Coherence Studies in the Optical Design of a Lithographic System,” M. Sc. Thesis, 2001.
- c. Tamer T. Elazhary, Masatsugu Nakano, and José Sasián, “Hyper numerical aperture imaging lens using a thin multi reflection Catadioptric optical element,” *Optics Express*, Vol. 21, Issue 13, pp. 15809-15814 (2013).
- d. Sasian J. M., Lerner S. A., Lin, T. Y., and Laughlin, L., “Ray and Van Citter-Zernike characterization of Spatial Coherence,” *Appl. Opt.* 40(7), 1037-1043, March 2001.
- e. Liang, C., Descour, M., Sasian, J., and Lerner, S., “Multilayer-coating-induced aberrations in extreme-ultraviolet lithography optics,” *Appl. Opt.* 40(1), 129-135, January 2001.
- f. J. M. Sasian, “Passive pupil correction as applied to annular field systems,” *Opt. Eng.* 38 (4) 646-649, 1999.
- g. J. M. Sasian, “Annular surfaces in annular field systems,” *Optical Engineering*, 36(12), 3401-3403, 1997.
- h. U.S. Patent No. 7,405,871, “Efficient EUV collector designs,” 2009.

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