UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FUJITSU NETWORK COMMUNICATIONS, INC.
Petitioner

v.

THOMAS SWAN & CO. LTD.
Patent Owner

Inter Partes Review Case No. IPR2014-01383
Patent 7,145,710

CORRECTED PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 7,145,710 UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. §§ 42.1-.80, 42.100-.123

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I. INTRODUCTION

Petitioner Fujitsu Network Communications, Inc. ("FNC") requests *inter partes* review of Claims 1, 3, 10, 11 and 13 ("Petitioned Claims") of U.S. Patent No. 7,145,710 ("the '710 patent") (Ex. 1001), assigned on the face of the patent to Thomas Swan & Co. Ltd. ("Thomas Swan"). The Petitioned Claims of the '710 patent are generally directed to "optical devices" that use a spatial light modulator ("SLM") comprising a two-dimensional array of pixels or "phase modulating elements" to control the direction of incident light beams. The technology claimed in the '710 patent has applications in fiber optic communications. The original patent application that led to the issuance of the '710 patent was filed in the United Kingdom on September 3, 2001.

Melanie Holmes ("Holmes") is listed as the sole purported inventor for the '710 patent and the priority application. As explained further below, the subject matter claimed in the '710 patent was developed and published by researchers at the University of Cambridge ("Cambridge") prior to the filing of the 2001 priority application. For about a decade prior to the filing of the priority application, researchers at Cambridge, working in Professor William Crossland's Photonics & Sensors group, investigated and published research relating to the use of liquid crystal SLMs in optical communication and other applications. This work is well documented and described in numerous publications emanating from Dr.

Crossland's group in the 1990s. See Ex. 1002, http://www-g.eng.cam.ac.uk/photonics_sensors/ people/bill-crossland.htm (biography of Prof. Crossland: "Bill Crossland held the position of Group Leader of the Photonics & Sensors Group . . . from 1992 . . . until his retirement at the end of September 2009. . . He is generally regarded as the founding father of liquid crystal over silicon (LCOS) technologies.") and Ex. 1003, http://www-g.eng.cam.ac.uk/photonics_sensors/publications/index.htm (providing an exemplary listing of publications from the Photonics & Sensors group).

In the years prior to the filing of the U.K. priority application, Holmes collaborated with Cambridge on the development and use of liquid crystal SLMs for optical beam routing and other applications. Holmes completed her Ph.D. requirements in 1992 and shortly thereafter began collaborating with Dr. Crossland who was working with doctoral candidates on research relating to liquid crystal SLMs for use in optical routing (Ex. 1004) (article entitled "Low Crosstalk Devices for Wavelength-Routed Networks," by M. J. Holmes, W. Crossland *et al*., IEE Colloquium on Guided Wave Optical Signal Processing, IEE Dig. No. 95-128 London, UK indicating collaboration with the Crossland group in at least 1995); (Ex. 1005) (article entitled "Holographic Optical Switching: The 'ROSES' Demonstrator," by W. A. Crossland, K.L. Tan, M.J. Holmes et al., Journal of Lightwave Technology, Vol. 18, No. 12, Dec. 2000, at 1845-54, indicating

collaboration with the Crossland group continued through at least 2001). One of those doctoral candidates was Stephen T. Warr. This doctoral candidate focused on research relating to liquid crystal SLMs for use in optical routing that culminated in a Ph.D. dissertation published by Cambridge. This Ph.D. dissertation forms the basis of this petition.

As explained further below, it is apparent that the claimed invention of the '710 patent was discovered and disclosed, prior to the filing of Holmes's U.K. priority application, through the research and publication of Dr. Warr. A review of the publication history of the Cambridge group preceding the priority application makes clear that Holmes worked closely with the Cambridge researchers—sometimes even in the same laboratory using the same devices—and the researchers openly shared their ideas with her. In addition, they frequently cite each other's work in their publications. Thus, by the time Holmes filed her U.K. priority application, a person having ordinary skill in the art ("PHOSITA") would have understood that the alleged inventions claimed in the '710 patent were rendered obvious by the prior work of the Cambridge researchers. Particularly in view of the working environment at Cambridge and the long history of cross-cited publications, express suggestions in the Cambridge researchers' publications would have strongly motivated a PHOSITA to combine the Cambridge publications relied upon in this petition. Moreover, the Petitioned Claims do not

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