

Filed on behalf of Godo Kaisha IP Bridge 1

By: Neil F. Greenblum (ngreenblum@gbpatent.com)
Greenblum & Bernstein, P.L.C.
1950 Roland Clarke Place
Reston, Virginia 20191
Tel: (703) 716-1191
Fax: (703) 716-1180

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
and GLOBALFOUNDRIES U.S. INC.,
Petitioners,

v.

GODO KAISHA IP BRIDGE 1,
Patent Owner.

Case IPR2016-01246¹
U.S. Patent No. 7,126,174

PATENT OWNER'S REQUEST FOR REHEARING

¹ Case IPR2016-01247 has been consolidated with this proceeding.

GlobalFoundries U.S. Inc.'s motions for joinder in Cases IPR2017-00925 and IPR2017-00926 were granted.

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I. Introduction

The Board misapplied the law of obviousness in the field of semiconductor fabrication and relied extensively upon the unreliable testimony of Dr. Banerjee to justify the unpatentability of claims 1-12 and 14-18 of U.S. Patent No. 7,126,174 (the “174 patent”), and for these reasons Patent Owner respectfully requests rehearing.

Petitioner had the initial burden of asserting “how” an STI would be substituted for the LOCOS of *Lee* and *Lowrey*. The Board credited the Declaration testimony of Dr. Banerjee who said the substitution could be performed by a POSITA without saying “how”, and granted the Petition. Petitioner’s Reply and Declaration then proceeded for the first time to explain “how” the substitution would be performed. Patent Owner objected and was granted limited permission to file a Sur-Reply, but without a supporting Declaration. The Deposition of Dr. Banerjee was then taken, and Patent Owner was authorized to include the Deposition transcript in the Sur-Reply.

The Board was mistaken to: 1) initiate the IPR based upon a Petition which did not explain “how” the substitution was to be performed; 2) not strike the Reply for explaining “how” for the first time; 3) to credit the testimony of Dr. Banerjee who contradicted himself and his Declaration; 4) not permit Patent Owner to file a Declaration with the Sur-Reply; 5) selectively ignore portions of the Banerjee

testimony and the Sur-Reply relating directly to the credibility of Banerjee and the unworkability of substituting STI into *Lee* and *Lowrey*.

II. The Board Misapprehended the Petition To Be Saying that the “Petition” Explained How *Lee* and *Noble* Are Combined

The Board asserts that Petitioner explains in detail how *Lee* and *Noble* are being combined referring back to Section II.D.3.b. of the Petition. FWD, p. 37. This section relies in part upon Dr. Banerjee’s testimony which the Board found persuasive. FWD, p. 16.

The Board mistakenly overlooks that neither the Petition nor Dr. Banerjee ever said “how” the reference processes were to be combined to arrive at a workable claimed invention. Petitioner itself acknowledged that its Petition had not set forth “how” the references were to be combined. Reply, p. 18, FN 9.

III. The Board Was Mistaken to Overlook the Obvious Complexity of Semiconductor Technology

Semiconductor fabrication technology is one of the most complex technologies there is. As was noted throughout this proceeding, every single applied reference, as well as virtually all of the remaining references devote numerous columns describing exactly how their devices, including their isolation, are formed. Dr. Schubert cited numerous supporting references in the literature explaining the intricate complexity of semiconductor fabrication, and how changes in one aspect impact the entire fabrication process. PO Response, Paper 14, p. 2;

Ex. 2012, ¶61; Ex. 2013-2019. The Board was mistaken to ignore the complexity of the fabrication process when analyzing the obviousness of forming trench isolation on the *Lee* and *Lowrey* devices.

Significantly, the Board overlooked Petitioner's Ex. 1060 (slide 108) which specifically shows that the substitution of STI for LOCOS to reduce the size of semiconductor devices resulted in a 50% increase in the number of fabrication steps. It actually says that process complexity for STI is "high". See Ex. 1060, p. 108; and Oral Hearing Transcript ("Trial Transcript"), Paper 46, p. 33.

The Board's attention was directed to *Samsung Electronics Co., Ltd., Micron Technology, Inc., and SK Hynix, Inc. v. ELM 3DS Innovations, LLC*, IRP2016-00394, Paper 64 (PTAB June 23, 2017) ("the '394 decision") which specifically addressed the complexity of semiconductor technology:

In the particular circumstances of this case, with its complex technology of integrated circuit fabrication and robust written description articulating general advantages of its membrane dielectric isolation process, we are not persuaded that Petitioner has met its burden to provide sufficient articulated reasoning with rational underpinning to support Petitioner's conclusion of obviousness."

Samsung, IPR2016-00394, Paper 64, p. 39.²

² The Board specifically asked whether Patent Owner was aware of any case law in the field of semiconductor manufacture establishing that given the complex

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