

Filed on behalf of Godo Kaisha IP Bridge 1

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**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED,  
and GLOBALFOUNDRIES U.S. INC.,

Petitioners,

v.

GODO KAISHA IP BRIDGE 1,  
Patent Owner.

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Case Nos. IPR2016-01249 and IPR2016-01264<sup>1</sup>  
U.S. Patent No. 6,538,324

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**PATENT OWNER'S REPLY  
TO PETITIONER'S OPPOSITION TO PATENT OWNER'S  
CONTINGENT MOTION TO AMEND FOR *INTER PARTES*  
REVIEW OF UNITED STATES PATENT NO. 6,538,324**

Mail Stop PATENT BOARD, PTAB  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

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<sup>1</sup> GlobalFoundries U.S. Inc.'s motions for joinder in Cases IPR2017-00919,-00920 were granted.

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**TABLE OF AUTHORITIES**

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**Cases**

*Shinn Fu Company of America, Inc. et al. v. The Tire Hanger Corporation*,  
IPR2015-00208, Paper 24, (April 22, 2016)..... 1

Patent Owner submits this Reply To Petitioner's Opposition To Patent Owner's Contingent Motion to Amend ("Reply"). Patent Owner has met its burden, procedurally and substantively, of establishing that Substitute Claims 11-13 are novel, non-obvious, and supported by the '324 patent's written description.

**I. THE PATENTS CITED BY PETITIONER ARE NOT MATERIAL**

In the Motion To Amend, Patent Owner discussed 28 references, including references not cited in the Petition. Ex.2037, ¶¶13, 83a-y. Petitioner asserts that Patent Owner did not discuss 7 of the 46 references identified in Ex.1037, *i.e.*, Exhibits 1025-1031. Exhibits 1025-1031 are not material and, at most, cumulative to the prior art of record.

There is no requirement that a patent owner seeking to amend its claims in an IPR must analyze immaterial and cumulative references, particularly where, as here, there are many different permutations. *See Shinn Fu Company of America, Inc. et al. v. The Tire Hanger Corporation*, IPR2015-00208, Decision, (April 22, 2016), p.20. Given the cumulative nature of the references and numerous possible permutations, Patent Owner complied with its duty of candor. Nevertheless, the deficiencies of Exhibits 1025-1031 are discussed herein.

**A. None Of The 7 References (Exs. 1025-1031) Is Material**

**1. UK Patent 2,298,657 is not material and merely cumulative**

UK 2,298,657 (“*Cho*”)(Ex.1025) is the only one of the 7 references substantively discussed by Petitioner (Opp., pp.2-4). Thus, Petitioner likely considers *Cho* to be most relevant, even though it is not substantively discussed in the expert’s declaration. Ex.1038.

*Cho* is cumulative to JP H8-250596A (“*JP ‘596*”)(Exs. 2016, 2017). *Cho* and *JP ‘596* claim priority to KR 1995-4447, and the allegedly relevant portion of *Cho*’s disclosure is the same in *JP ‘596*. *Cho* and *JP ‘596* disclose a process of CVD forming layer 3 of Ti and layer 4 of amorphous TiN. Layer 4 is annealed to form layers 5-7, where layer 5 is amorphous titanium nitride, layer 6 is crystalline titanium nitride, and layer 7 is crystalline nitrogen-rich titanium nitride. Ex.1025, p.9 of 13; Ex.2017, p.5 of 9. *Cho* and *JP ‘596* disclose that layer 4 (amorphous) has a high resistance, which is decreased by phase transitioning layer 4 to the three-layered titanium nitride (layers 5,6,7) each having different properties. *Id.* Thus, *Cho* and *JP ‘596* disclose a specifically configured diffusion barrier including titanium layer 3 with annealed layers 5,6,7 formed by a specialized CVD/annealing process forming a specifically configured diffusion barrier. There is no disclosure of the relative nitrogen content in layers 5,6,7, however, layer 7 is

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