

Filed on behalf of Godo Kaisha IP Bridge 1

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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 IPR2016-01264¹
U.S. Patent No. 6,538,324

PATENT OWNER'S REQUEST FOR REHEARING

¹ GlobalFoundries U.S. Inc.'s motion for joinder in Case IPR2017-00920 was granted.

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The Final Written Decision (“FWD”)(Paper 46) finds claims 1–3, 5–7, and 9 (“Challenged Claims”) of U.S. Patent No. 6,538,324 (the “324 patent”) unpatentable as obvious over (1) *Zhang* in view of *Ding*; and, (2) *Zhang* in view of *Ding* in further view of *Sun*.² The Board dismissed Patent Owner’s Motion to Amend as moot. FWD (Paper 46), p. 29.

Patent Owner asserts that the Board overlooked and misapprehended pertinent disclosure in *Zhang* and *Ding*, and Patent Owner’s arguments regarding their proposed combination, and respectfully requests rehearing.

I. The Board Misapprehended Patent Owner’s Arguments That Any Combination Of *Zhang* And *Ding* Would Retain A Pure Ta Surface

The Board summarized Patent Owner’s arguments as follows:

Patent Owner’s arguments, reproduced above, are premised on: (1) *Zhang* **exclusively** teaching an upper surface of pure tantalum and (2) the claims requiring nitrogen throughout the first film. Both premises are erroneous. *Zhang* teaches nitrogen in the tantalum-rich tantalum nitride film, including at its upper surface. *See* Ex. 1004, 3:53–62. And, the claims require nitrogen in the first film, but not throughout the first film. Accordingly, Patent Owner’s arguments fail to rebut Petitioner’s obviousness arguments, which are identified above and which we find persuasive.

FWD (Paper 46), p. 25 (emphasis added).

The Board misapprehended Patent Owner’s arguments. Patent Owner did

² *Sun* is not relevant to any of the matters discussed in this Request for Rehearing.

not argue that *Zhang* **exclusively** taught an upper surface of pure tantalum. Rather, Patent Owner argued that *Zhang* taught the **desirability** of an upper surface of pure tantalum (emphasis added in each quote): “*Zhang* also teaches the **desirability** that ‘the upper surface of the tantalum-rich tantalum nitride film is substantially pure tantalum and has **essentially no nitrogen atoms**.’” PO Response (Paper 14), p. 24; “A PHOSITA would have understood *Zhang* to teach the **desirability** of forming a film having an upper surface of pure tantalum to provide better adhesion to the copper film.” PO Response, p. 27; “Second, as both *Zhang* and *Ding* teach the **desirability** of having a pure tantalum film on which to form a copper layer...” PO Response, p. 34; “Both *Zhang* and *Ding* disclose the **desirability** of having a pure metal layer on which to form a copper layer.” PO Response, p. 35; “A PHOSITA reading *Zhang* would readily recognize that *Zhang*, like *Ding*, discloses the **desirability** of a layer of pure tantalum over a layer of tantalum nitride.” PO Response, p. 37; “As both *Ding* and *Zhang* teach the **desirability** of a layer of pure tantalum over a layer of tantalum nitride, a PHOSITA would have recognized the nearly identical nature of both films in *Ding* and *Zhang*, and would thus not have been motivated to modify *Ding* in view of *Zhang* to arrive at the claimed subject matter (but for impermissible hindsight).” PO Response, p. 39; *Zhang* and *Ding* individually teach the **desirability** of having a layer of pure tantalum on which to form a layer of copper.” *Id.*; “Both *Zhang* and *Ding* teach the **desirability** of

forming a film having a surface of pure tantalum to contact a copper film.” PO Response, p. 21; “As both *Zhang* and *Ding* disclose the desirability of layers having an upper surface composed of pure tantalum, *i.e.*, containing no nitrogen, a PHOSITA combining *Zhang* and *Ding* would result with layers having an upper surface composed of pure tantalum.” PO Response, p. 51.

With respect to Patent Owner’s arguments regarding *Zhang* teaching the desirability of an upper surface of pure tantalum, the Board further overlooked (1) the embodiment in *Zhang* of an entire top film that does not contain nitrogen; and, (2) embodiments in *Zhang* with an upper surface that does not include nitrogen. *See* PO Response, pp. 24-26. Even Petitioner acknowledges that *Zhang* discloses an embodiment that has an upper surface which is “substantially pure tantalum”:

Zhang discloses an embodiment in which the top film of the two-layer diffusion barrier is a “tantalum-rich tantalum nitride film” that has an upper surface which is “substantially pure tantalum.” Ex. 1004, 3:54-57, FIG. 4. [footnote omitted].

Petition (Paper 2), p. 16.

Patent Owner specifically argued *Zhang*’s embodiments with substantially pure tantalum:

Zhang also teaches the desirability that “the upper surface of the tantalum-rich tantalum nitride film is substantially pure tantalum and has essentially no nitrogen atoms.” *Id.*, 3:54-57 (emphasis added);

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