

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Taiwan Semiconductor Manufacturing Company Limited
Petitioner,

v.

Godo Kaisha IP Bridge 1
Patent Owner.

Inter Partes Review No. IPR2016-01249
U.S. Patent No. 6,538,324

**PETITIONER'S RESPONSES TO PATENT OWNER'S MOTION FOR
OBSERVATIONS REGARDING THE
CROSS-EXAMINATION OF SANJAY K. BANERJEE, PH.D.**

Petitioner provides the following responses to Patent Owner's observations on the cross-examination testimony of Sanjay K. Banerjee, Ph.D. (Paper 28).

Response to Observation No. 1:

The cited testimony (Exhibit 2044, 53:3-16) is misleading and incomplete. His testimony at 52:3-53:16, which includes Patent Owner's cited testimony, merely agreed with the M.P.E.P.'s statement that the phrase "composed of" may mean "consisting essentially of" depending on the context:

Q So would it be fair to say under the broadest reasonable interpretation of the claims of the '324 patent that the word "composed" or "composed of," as it appears in the claims of the '324 patent, means consisting essentially of --

MR. KABAKOFF: Objection to form.

By MR. FINK:

Q -- as that was defined on the previous page [of the M.P.E.P.]?

A Yes. But as it says, it depends on the facts of that particular scenario.

Id., 53:3-13. Dr. Banerjee's testimony does not contradict Petitioner's argument that the intrinsic evidence of the '324 patent supports an interpretation of "composed of" that allows for portions of the film to be solely tantalum metal (β -Ta) without nitrogen. Reply (Paper 19), 6.

Response to Observation No. 2:

The cited testimony (Exhibit 2044, 54:7-18) is incomplete and misleading. Dr. Banerjee was merely agreeing with a statement in the M.P.E.P. presented for the first time at his deposition. He further testified that “composed of” means added materials cannot impact the adhesive properties of the upper surface of the film and the blocking capabilities of the lower portion of the film:

Q So you would understand reading the claims of the '324 patent where it used composed of should mean consisting essentially of?

A Yes, essentially of, as in you do not negatively impact the adhesive properties of the copper to that film.

* * *

Q So the only part of the film then you care about is the surface? You don't care about the rest of the film?

A No. You care about everything: the surface in terms of the adhesion and the lower part in terms of the blocking capabilities of the copper.

Id., 54:20-55:3, 55:16-21.

Dr. Banerjee's testimony supports Petitioner's argument that the intrinsic evidence of the '324 patent supports an interpretation of “composed of” that allows for the inclusion of other materials. Reply, 6. Dr. Banerjee's testimony contradicts Patent Owner's argument that “a crystalline metal film containing nitrogen

therein” cannot contain any amount of “pure metal,” “amorphous metal nitride,” or “crystalline metal nitride.” POR (Paper 14), 14.

Response to Observation No. 3:

The cited testimony (Exhibit 2044, 56:4-13) is incomplete. In the cited testimony, Dr. Banerjee was merely agreeing with a statement in the M.P.E.P. presented for the first time at his deposition. Dr. Banerjee’s testimony supports Petitioner’s argument that the intrinsic evidence of the ’324 patent supports an interpretation of “composed of” that allows the top film to have pockets of beta-tantalum crystallites having no nitrogen. Reply, 6.

Response to Observation No. 4:

The cited testimony (Exhibit 2044, 115:1-116:15) is incomplete. Moreover, his testimony about whether the district court’s construction, based on a different standard, appears “reasonable” is irrelevant. *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131 (2016). Dr. Banerjee testified he did not know how the district court arrived at its construction:

BY MR. FINK:

Q ... Why should the Board accept your understanding of how a person of ordinary skill in the art would construe the phrase “said first film being composed of crystalline metal containing nitrogen therein” as to -- as opposed to accepting the District Court’s claim interpretation?

MR. KABAKOFF: Objection, form.

THE WITNESS: I don't know if the District Court went through this discussion that we had earlier about the heterogeneity of the films versus homogeneity of the films and all that but --

Id., 122:15-123:5; *see also* 121:5-10.

Dr. Banerjee's testimony supports Petitioner's argument that the Board should reject Patent Owner's attempts to import an unclaimed limitation of a crystalline metal containing nitrogen "throughout" based on manufacturing methods disclosed in embodiments of the '324 patent. Reply, 3-4.

Response to Observation No. 5:

The cited testimony (Exhibit 2044, 48:6-51:12) is incomplete. His cited testimony relates to whether adding amorphous tantalum nitride to a crystalline metal film would affect the properties of the film, which he later testified would depend on the amount of amorphous nitride added:

Q In your opinion would composed of be interpreted to mean comprising, which is more open ended?

A I mean, if you look at the objectives of the '324 patent, the role of the first film is to enable the copper to stick very well to that first film, so as long as the crystalline component of that was large enough to enable good adhesion properties, that'd be okay. But if you kept adding more and more of this amorphous nitride where it causes the copper to delaminate, I don't think that would be okay.

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