

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTEL CORPORATION, GLOBALFOUNDRIES U.S., INC.,
MICRON TECHNOLOGY, INC. and
SAMSUNG ELECTRONICS COMPANY, LTD.¹,
Petitioner,

v.

DANIEL L. FLAMM,
Patent Owner.

Case IPR2017-00281
Patent RE40,264 E

Before CHRISTOPHER L. CRUMBLEY, JO-ANNE M. KOKOSKI, and
KIMBERLY McGRAW, *Administrative Patent Judges*.

McGRAW, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

¹ Samsung Electronics Company, Ltd. was joined as a party to this proceeding via a Motion for Joinder in IPR2017-01750.

I. INTRODUCTION

In this *inter partes* review, instituted pursuant to 35 U.S.C. § 314, Intel Corporation, GLOBALFOUNDRIES U.S., Inc., Micron Technology, Inc. and Samsung Electronics Company, Ltd., (collectively “Petitioner”) challenge the patentability of claims 37–50 and 67 of U.S. Patent No. RE40,264 (Ex. 1001, “the ’264 patent”), owned by Daniel L. Flamm. (“Patent Owner”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision, issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73, addresses issues and arguments raised during trial. For the reasons discussed below, we determine that Petitioner has shown by a preponderance of the evidence that claims 37–50 and 67 of the ’264 patent are unpatentable.

A. Procedural History

On December 2, 2016, Intel Corporation, GLOBALFOUNDRIES U.S., Inc., and Micron Technology, Inc. (collectively, “Initial Petitioners”) filed a Petition requesting an *inter partes* review of claims 37–50 and 67 of the ’264 patent. Paper 2 (“Pet.”). Patent Owner filed a Preliminary Response. Paper 8. On June 13, 2017, we instituted an *inter partes* review of the challenged claims. Paper 10 (“Decision on Institution” or “Dec. on Inst.”) Subsequent to institution, Samsung Electronics Company, Ltd. (“Samsung”) filed a petition and motion for joinder with the instant proceeding. *Samsung Electronics Company, Ltd. v. Daniel L. Flamm*, Case IPR2017-01751, Papers 1, 3. On September 15, 2017, we granted Samsung’s petition and motion for joinder, joining Samsung as a petitioner in this *inter partes* review. Paper 14, 7.

Thereafter, Patent Owner filed a Patent Owner Response (Paper 13, “PO Resp.”) and Petitioner filed a Reply (Paper 15, “Reply”). The Petition is supported by the Declaration of Dr. John Bravman (Ex. 1006, “the Bravman Declaration”) and the Reply is supported by the Reply Declaration of Dr. John Bravman (Ex. 1024, “the Bravman Reply Declaration”). Patent Owner’s Response is supported by the Declaration of Dr. Daniel L. Flamm² (Ex. 2001, “the Flamm Declaration”).

Oral hearing was requested by both parties. Papers 16, 17. A consolidated oral hearing for this proceeding and Cases IPR2017-00279, IPR2017-00280, and IPR2017-000282, involving the same parties and the ’264 patent, and Cases IPR2017-00391, IPR2017-00392, and IPR2017-00406, involving the same parties and unrelated patents, was held on March 7, 2018. A transcript of the consolidated hearing has been entered into the record. Paper 29 (“Tr.”).

B. Related Proceedings

Petitioner reports that the Patent Owner has asserted the ’264 patent in five proceedings in the Northern District of California (Case Nos. 5:16-cv-01578-BLF, 5:16-cv-1579-BLF, 5:16-cv-1580-BLF, 5:16-cv-1581-BLF, and 5:16-cv-02252-BLF) and that Lam Research Corporation has filed a declaratory judgment action against Patent Owner on the ’264 patent, also in the Northern District of California (Case No. 5:15-cv-01277-BLF). Pet. 2.

² Daniel L. Flamm is both the Patent Owner and Patent Owner’s declarant in this proceeding.

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Petitioner also challenges certain claims of the '264 patent in IPR2017-00279, IPR2017-00280, and IPR2017-00282, which were filed concurrently with the Petition in this proceeding. The parties also identified nine other IPR petitions for review of the '264 patent, filed by Lam Research Corporation or Samsung, none of which are currently pending. *See* Pet. 2; Prelim. Resp. 1 (identifying IPR2015-01759 (institution denied); IPR2015-01764 (terminated-settled); IPR2015-01766 (institution denied); IPR2015-01768 (terminated-settled); IPR2016-00468 (institution denied); IPR2016-00469 (institution denied); and IPR2016-00470 (institution denied); IPR2016-01510 (institution denied) and; IPR2016-01512 (Final Written Decision – challenged claims unpatentable)).

C. The '264 Patent

The '264 patent, titled “Multi-Temperature Processing,” relates generally to methods and systems for controlling the heating and cooling time of a substrate (e.g., wafer) during plasma processing in a single processing chamber. *See, e.g.*, Ex. 1001, 1:18–21. A “plasma etching apparatus according to the present invention” is shown in Figure 1 of the '264 patent, reproduced below. *Id.* at 2:66–67.

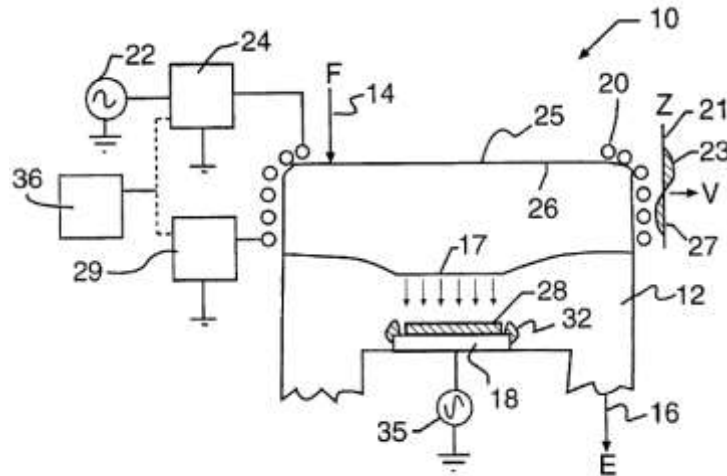


FIG. 1

Figure 1 above illustrates a plasma etching apparatus having chamber 12 and a substrate holder (product support chuck or pedestal 18) for holding a substrate (product 28, such as a wafer to be etched). *Id.* at 3:24–25, 3:32–33, 3:40–42. The substrate holder, which is thermally coupled to the substrate, “can rapidly change its temperature.” *Id.* at 3:51–55.

One embodiment of a temperature control system according to the invention is shown in Figure 7 below. *Id.* at 3:11–13, 15:65–67.

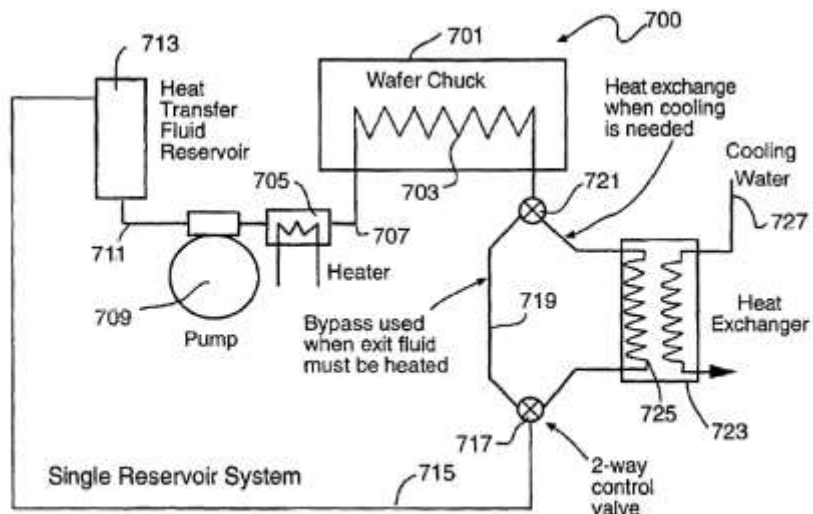


Fig. 7

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