

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO. LTD.,
SAMSUNG ELECTRONICS AMERICA, INC.,
SAMSUNG SEMICONDUCTOR, INC., and
SAMSUNG AUSTIN SEMICONDUCTOR, LLC,

Petitioners

v.

CHIEN-MIN SUNG,

Patent Owner

IPR2024-00533
U.S. Patent No. 8,974,270

PATENT OWNER'S DEMONSTRATIVES

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Patent Trial and Appeal Board
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Submitted Electronically via PTACTS

Samsung v. Chien-Min Sung, IPR2024-0533 U.S. Patent No. 8,974,270

Oral Argument

June 20, 2025

- I. Background
- II. Ground 1: The Combination of Chou and Sung '479
- III. Samsung's Unqualified Expert &
PO's Motion to Exclude
- IV. Grounds 2-3

Background

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

The '270 Patent

- The '270 patent reflected the updated understanding of a POSITA that only a small percentage of superabrasive particles in a typical CMP pad dresser are working particles. (Paper 20 at 15; Ex. 2004 at ¶55)
- Rather than try to eliminate the outliers to share the workload, as prior art solutions including Sung '479 taught, the '270 patent focuses on bounding and characterizing the protrusion among, and variance in, the outlying superabrasive particles that actually performed the work. (Paper 20 at 16; *See, e.g.*, Ex. 1001 at Abstract; *see* Ex. 2004 at ¶57.)
- The claimed embodiment involves a two-sided pad dresser having a 50-micron maximum height variation between working particles: the highest and second-highest protruding tips differing by ~50 microns (or less). (Paper 20 at 16; Ex. 1001 at 17:38-18:2.)

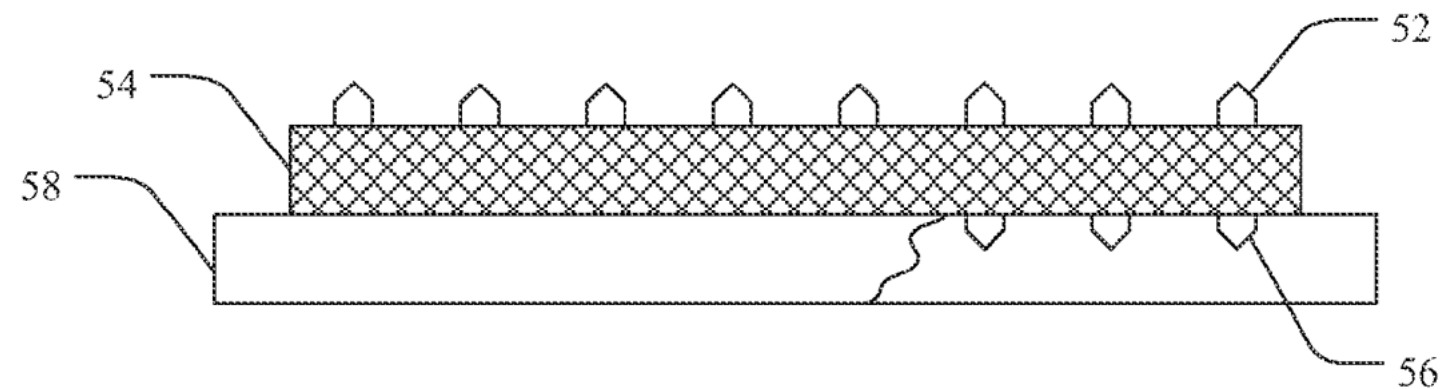


FIG. 5

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Claim 1

1. A CMP pad dresser, comprising:
 - a first monolayer of superabrasive particles disposed on and protruding from one side of a metal support layer, wherein the difference in protrusion distance between the highest protruding tip and the second highest protruding tip of the monolayer of superabrasive particles is less than or equal to about 50 microns;
 - a second monolayer of superabrasive particles disposed on the metal support layer on an opposite side from the first monolayer, wherein the superabrasive particles of the second monolayer are positioned to have substantially the same distribution as the superabrasive particles of the first monolayer; and
 - a rigid support coupled to the second monolayer of superabrasive particles opposite the first monolayer.

(Ex. 1001 at 17:35-18:10.)

Important Considerations

- “[T]he burden of persuasion is on the petitioner to prove ‘unpatentability by a preponderance of the evidence,’ 35 U.S.C. § 316(e), and that burden never shifts to the patentee.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1375 (Fed. Cir. 2016).
- “[A] standalone § 103 reference must enable the portions of its disclosure being relied upon.” *Raytheon Techs. Corp. v. GE*, 993 F.3d 1374, 1380 (Fed. Cir. 2021).
- Sung’479 Is Not Enabling for Petitioners’ Purpose
- Chou and Sung’479 Do Not Disclose Claim 1
- No Motivation to Combine Chou and Sung’479

Ground 1: The Combination of Chou and Sung '479 Does Not Render Obvious Claims 1, 3-8

- A. Sung'479 Is Not Enabling to Teach “difference in protrusion distance . . . is less than or equal to about 50 microns”
- B. Chou and Sung'479 Do Not Disclose Claim 1
- C. No Motivation to Combine Chou and Sung'479

Claim 1

1. A CMP pad dresser, comprising:
 - a first monolayer of superabrasive particles disposed on and protruding from one side of a metal support layer, wherein the difference in protrusion distance between the highest protruding tip and the second highest protruding tip of the monolayer of superabrasive particles is less than or equal to about 50 microns;
 - a second monolayer of superabrasive particles disposed on the metal support layer on an opposite side from the first monolayer, wherein the superabrasive particles of the second monolayer are positioned to have substantially the same distribution as the superabrasive particles of the first monolayer; and
 - a rigid support coupled to the second monolayer of superabrasive particles opposite the first monolayer.

(Ex. 1001 at 17:35-18:10.)

Claim 1 - The Main Dispute (“Element [1B]”)

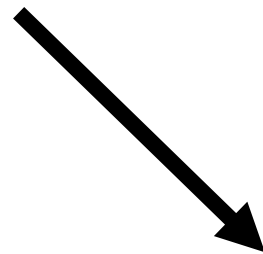
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“Element [1B]”

Sung'479 Is Not Enabling to Teach Element [1B]

Only Sung'479 Is Alleged to Teach Element [1B]

- “Chou, however, *does not explicitly teach* that the difference in protrusion distance between the two highest protruding tips is less than or equal to about 50 microns.”
(Paper 5 at 28-29.)

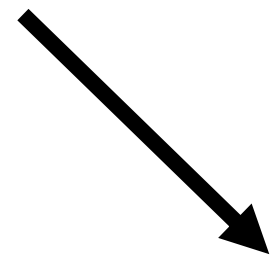


- Sung'479 stands alone for Element [1B].
(Paper 20 at 20; Paper 27 at 7.)

Sung'479 Must Be Enabling for Element [1B]

- “[A] standalone § 103 reference must enable the portions of its disclosure being relied upon. In this context the reference must necessarily enable the relied-upon portion of its own disclosure—*the same standard applied to anticipatory references.*” *Raytheon Techs. Corp. v. GE*, 993 F.3d 1374, 1381 (Fed. Cir. 2021).

(Paper 20 at 6.)



- Sung'479 *must be* enabling for Element [1B]
(Paper 20 at 20; Paper 27 at 7.)

Sung'479 Is NOT Enabling for Element [1B]

- A. Sung'479's Numeric Values Unachievable (Paper 20 at 23, 28-29, 32.)
- B. Different and Non-overlapping Brazing Conditions (Paper 20 at 21.)
- C. Undefined Terminology
- D. Undefined Double-sided Leveling (Paper 20 at 24-25.)
- E. No Working Examples or Prototypes (Paper 20 at 25.)
- F. PO Refuted Presumption of Enablement (Paper 27 at 8-9.)
- G. The '786 Application Is Irrelevant (Paper 27 at 10-11.)

Sung'479 Is NOT Enabling for Element [1B]

A. Sung'479's Numeric Values Unachievable (Paper 20 at 23, 28-29, 32.)

- “Based on my experience in CMP pad design and measurement, and my understanding of the development of CMP pad dressers at that time, circa 2005-2007, it was not practically achievable to consistently and predictably manufacture a BDD CMP pad dresser having superabrasive particle tip height variation less than 50 microns.” (Declaration of Dr. Tsai, Ex. 2004 at ¶32.)

(See Paper 20 at 23, 28-29, 32; Paper 27 at 16.)

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(See Paper 20 at 23, 28-29, 32; Paper 27 at 16.)

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Sung'479 Is NOT Enabling for Element [1B]

- ☑ A. Sung'479's Numeric Values Unachievable (Paper 20 at 23, 28-29, 32.)
- B. Different and Non-overlapping Brazing Conditions (Paper 20 at 21.)
 - Sung '479 is expressly limited to brazes having melting point temperatures of under 700 degrees. (*E.g.*, Ex. 1005 at Abstract, [0009], [0013], [0051], [0061], [0063], claim 1)
 - The '270 patent uses brazes having melting point temperatures of 700-1200 degrees. (*e.g.*, Ex. 1001 at 11:64-12:2)
 - A POSITA would not have been able to apply the low-temperature teachings of Sung'479 to the higher-temperature brazes of the '270 patent without undue experimentation. (Ex. 2004 at ¶62.)

(Paper 20 at 21.)

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- ☑ B. Different and Non-overlapping Brazing Conditions (Paper 20 at 21.)

- Sung '479 is expressly limited to brazes having melting point temperatures of under 700 degrees. (*E.g.*, Ex. 1005 at Abstract, [0009], [0013], [0051], [0061], [0063], claim 1)
- The '270 patent uses brazes having melting point temperatures of 700-1200 degrees. (*e.g.*, Ex. 1001 at 11:64-12:2)
- A POSITA would not have been able to apply the low-temperature teachings of Sung'479 to the higher-temperature brazes of the '270 patent without undue experimentation. (Ex. 2004 at ¶62.)

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UNREBUTTED

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- C. Undefined Terminology (Paper 20 at 22-24.)

1. “leveling surface”

- What is it?
- Why and how does it result in different “RA values”?

2. “designated profile”

- How does a POSITA align the particles along it?

3. “spacer layer”

- How is it removed while retaining particle alignment?

(Paper 20 at 22-24; Ex. 2004 at ¶¶32, 63-65.)

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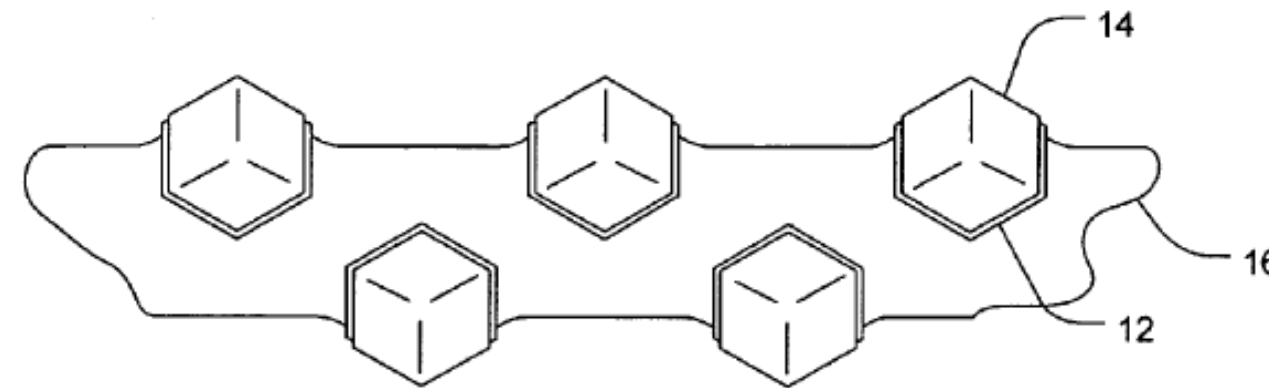
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- D. Undefined Double-sided Leveling (Paper 20 at 24-25.)
 - No description is given as to how particles on such a two-sided structure would be leveled or the extent to which those particles could be leveled. (Paper 20 at 24-25; Ex. 2004 at ¶66.)



(Ex. 1005, FIG. 6)

Sung'479 Is NOT Enabling for Element [1B]

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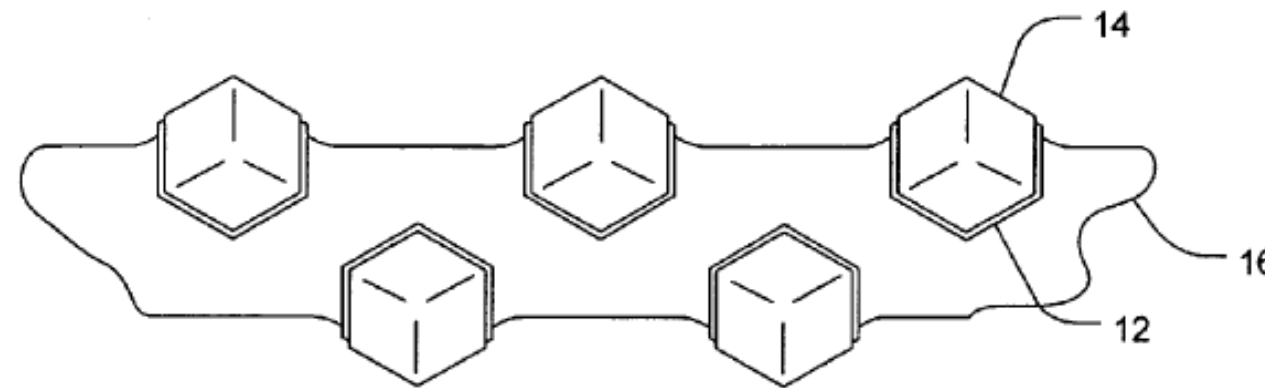


FIG. 6

(Ex. 1005, FIG. 6)

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 - E. No Working Examples or Prototypes (Paper 20 at 25.)
-
- Nothing to validate leveling processes
(Ex. 2004 at ¶67.)

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- F. PO Refuted Presumption of Enablement (Paper 27 at 8-9.)
 - “If a patentee presents evidence of nonenablement that a trial court finds persuasive, the trial court must then **exclude that particular prior art** patent in any anticipation inquiry, for then the presumption has been overcome.”
Amgen Inc. v. Hoechst Marion Roussel, 314 F.3d 1313, 1355 (Fed. Cir. 2003); *see also In re Antor Media Corp.*, 689 F.3d 1282, 1288 (Fed. Cir. 2012) (extending to prior art printed publications); *Apple Inc. v. Corephotonics, Ltd.*, 861 F. App'x 443, 450 (Fed. Cir. 2021) (extending to AIA proceedings).

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Sung’479 (Ex. 1005)	’786 Application (Ex. 1053)
Abstract: “[A] method for making a low-melting point superabrasive tool Such a method may include . . . bonding together the plurality of superabrasive particles with a <u>molten braze</u> that wets the reactive element at a temperature of less than about 700° C.”	Title: Methods Of Bonding Superabrasive Particles In An <u>Organic Matrix</u>

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Brazed ≠ Organic

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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NOT ENABLING

The Combination of Chou and Sung '479 Does Not Teach Element [1B]

Chou and Sung'479 Do Not Teach Element [1B]

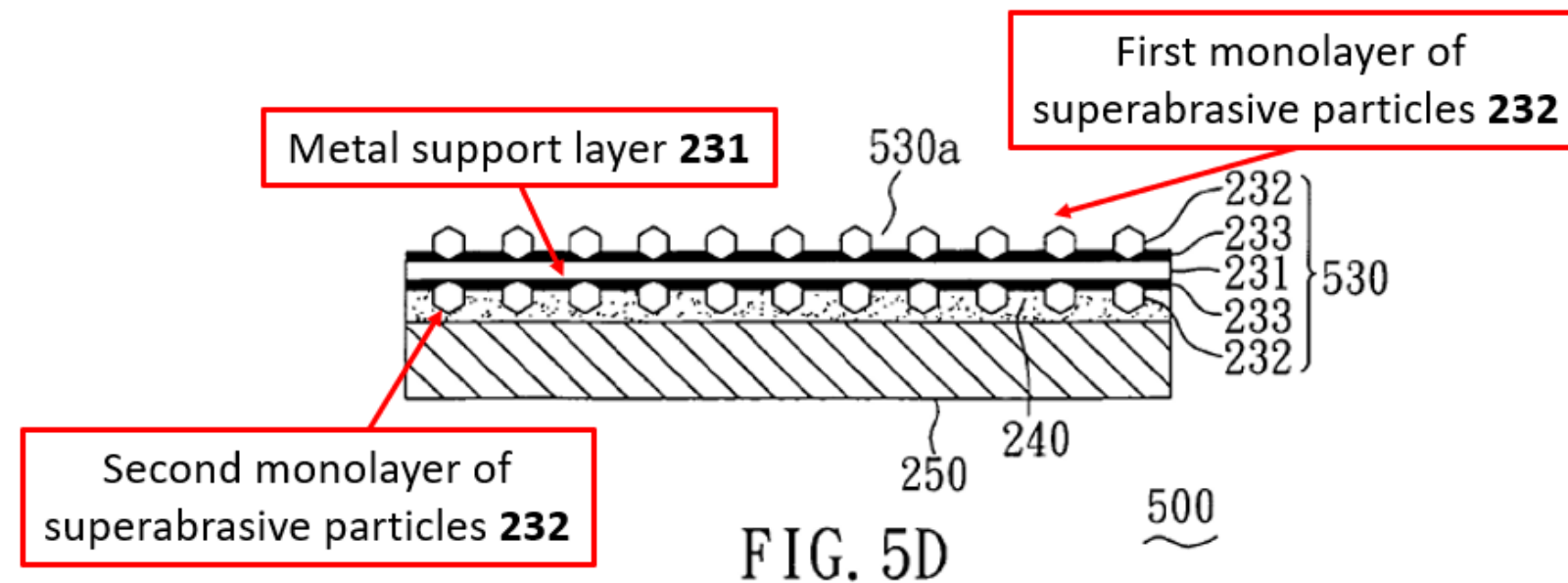
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- C. No Motivation to Combine Chou and Sung'479 (Paper 20 at 29-33.)
- D. Chou and Sung'479 Are Incompatible (Paper 20 at 32-33.)
- E. The '270 Patent Uses Different Brazing (Paper 20 at 31-33; Paper 27 at 21-22.)

A. The Institution Decision Is Not Final (Paper 27 at 14-15.)

- The burden required to institute trial is reasonable likelihood of success. 35 U.S.C. § 314
- The burden required to prove invalidity is preponderance of the evidence, a higher standard. 35 U.S.C. § 316.
- The Board “is free to change its view of the merits after further development of the record, and should do so if convinced its initial inclinations were wrong.” *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016).

Chou and Sung'479 Do Not Teach Element [1B]

- A. The Institution Decision Is Not Final (Paper 27 at 14-15.)
- B. Sung'479's Numeric Values Were Unachievable (Paper 20 at 23, 28-29, 32) & Chou Has None (Paper 27 at 15)
- Chou does not describe particular protrusion distances, let alone micron-sized distances. (Paper 27 at 15; Paper 20 at 27-28; Ex. 1004.)



- “[I]t is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue.”
Hockerson-Halberstadt, Inc. v. Avia Group Int’l, 222 F.3d 951, 956 (Fed. Cir. 2000)

Chou and Sung'479 Do Not Teach Element [1B]

- A. The Institution Decision Is Not Final (Paper 27 at 14-15.)
- B. Sung'479's Numeric Values Were Unachievable (Paper 20 at 23, 28-29, 32) & Chou Has None (Paper 27 at 15)
- Sung'479's distances were not possible:
“Based on my experience in CMP pad design and measurement, and my understanding of the development of CMP pad dressers at that time, circa 2005-2007, it was not practically achievable to consistently and predictably manufacture a BDD CMP pad dresser having superabrasive particle tip height variation less than 50 microns.” (Declaration of Dr. Tsai, Ex. 2004 at ¶32.)

(See Paper 20 at 23, 28-29, 32; Paper 27 at 16.)

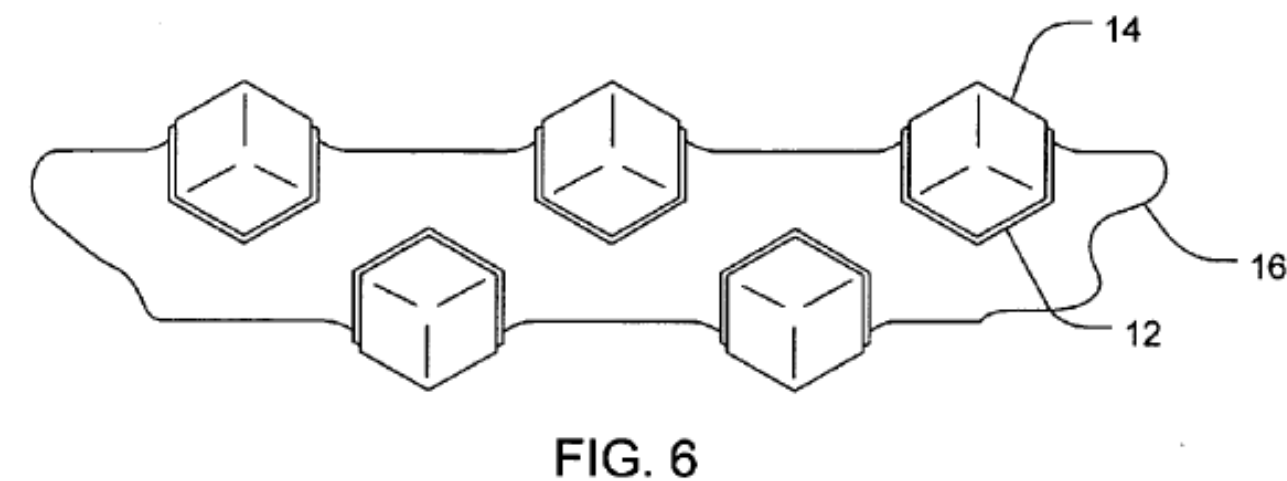
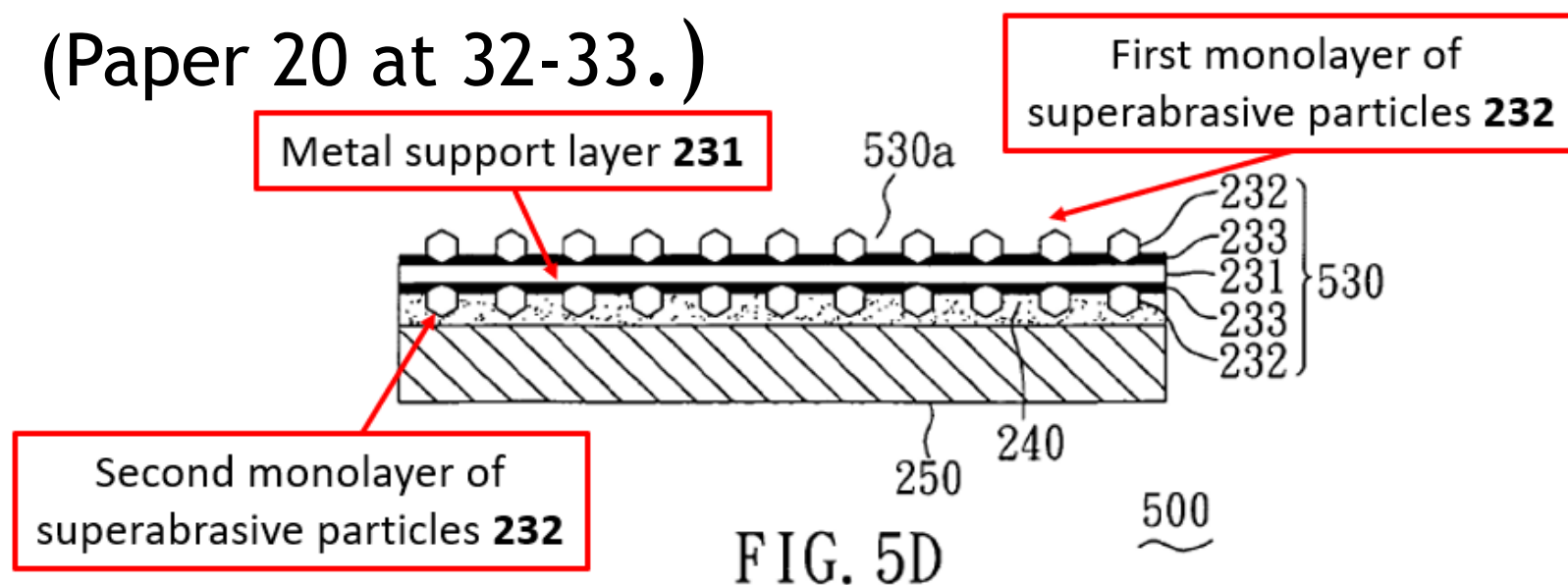
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 - C. No Motivation to Combine Chou and Sung'479 (Paper 20 at 29-33.)
- Petitioners say there is motivation to combine because Sung'479's low temperatures create less warpage, thus reducing tip height variance. (Paper 5 at 36; Paper 20 at 30.)
 - But Chou alleges to solve this problem already. (Paper 20 at 30-31; Ex. 1004 at [0024].)
 - Why would a POSITA look to Sung'479 to solve a solved problem?

Chou and Sung'479 Do Not Teach Element [1B]

- A. The Institution Decision Is Not Final (Paper 27 at 14-15.)
 - B. Sung'479's Numeric Values Were Unachievable (Paper 20 at 23, 28-29, 32) & Chou Has None (Paper 27 at 15)
 - C. No Motivation to Combine Chou and Sung'479 (Paper 20 at 29-33.)
 - D. Chou and Sung'479 Are Incompatible (Paper 20 at 32-33.)
- Chou shows particles 232 in separate braze layers 233 on opposite sides of a substrate 231. (e.g., Ex. 1004 at [0039], Fig. 5D).
 - Sung'479 at best shows particles 14 on opposite sides of a single braze 16. (Ex. 1005, Fig. 6.)
 - Are protrusion distances the same on both sides? What about warping?

(Paper 20 at 32-33.)



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- C. No Motivation to Combine Chou and Sung'479 (Paper 20 at 29-33.)
- D. Chou and Sung'479 Are Incompatible (Paper 20 at 32-33.)
 - Chou selects a grinding plate thickness to reduce warping. (*E.g.*, Ex. 1004 at [0007]-[0010].)
 - The grinding plate removes the need for any rigid support or metal support layer that is required in claim 1 of the '270 patent and the support matrix of Sung'479.
 - Sung'479 uses low temperatures without using a grinding plate.
 - Chou is also substantively different in that it uses epoxy for bonding diamonds.
 - Sung'479 relies on the support matrix or substrate—neither of which is epoxy—for particle or diamond bonding.
 - Chou does not require a spacer layer due to use of epoxy resin. (*E.g.*, Ex. 1004 at [0035].)
 - Sung'479 requires a spacer layer with its braze matrix. (*E.g.*, Ex. 1005 at [0083].)

(Paper 27 at 22-23.)

Chou and Sung'479 Do Not Teach Element [1B]

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- E. The '270 Patent Uses Different Brazing (Paper 20 at 31-33; Paper 27 at 21-22.)
 - Sung'479 is expressly limited to brazes having melting point temperatures of under 700 degrees.
 - The '270 patent uses brazes having melting point temperatures of 700-1200 degrees.
 - Why would a POSITA look to Sung'479 with respect to the '270 patent?

(See Ex. 2004 at ¶62.)

Samsung's Unqualified Expert & PO's Motion to Exclude

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

The Institution Decision's Level of Skill In the Art Was Not Final

- The Board adopted Petitioners' initial POSITA definition only “for purposes of this [Institution] Decision.” (Paper 16 at 7.)
- The Board expressly noted that the Institution Decision was made at a “preliminary stage” and that the Board “has not made a final determination with respect to . . . any underlying factual or legal issue.” (Paper 16 at 42.)
- “The Board’s final determination will be based on the record as developed during the *inter partes* review.” (*Id.*)
- Patent Owner developed the record on this issue. Petitioners did not.

Level of Skill In the Art

- A POSITA for purposes of the '270 patent includes at least two years of experience in developing CMP technology including experience with the design and development of CMP pad dressers.
- Specific experience with CMP pad conditioners is necessary due to the particularized context of this distinct technical field which requires knowledge of:
 - abrasive materials,
 - mechanical wear mechanisms,
 - pad/wafer interaction physics,
 - performance optimization of pad conditioners.
- General expertise in semiconductor manufacturing is insufficient.

(Paper 20 at 3; See EX1051, 171:7-172:3, 214:17-215:21; Paper 32 at 3-7.)

Dr. Shanfield's Experience

Stanley Shanfield



Curriculum Vitae for Stanley Shanfield

Education:

Massachusetts Institute of Technology, Ph.D., Physics, 1981

University of California, Irvine, B.S. Cum Laude, Physics, 1977

Educational Awards:

Outstanding Research Project, U.C. Regents Award, 1977

Phi Beta Kappa, 1977

Four Year Scholarship, Tuition & Research, ERDA/DOE, 1977-1981

Hands-On Professional Expertise:

Semiconductor Physics & Chemistry
Semiconductor Fabrication: Silicon and III-V Materials
Semiconductor Device & Integrated Circuit Engineering
Semiconductor Equipment: Front & Back End
Semiconductor Packaging Design and Manufacturing
Passive Component Design and Manufacturing
RF Design and Fabrication
Digital Design & Fabrication
Semiconductor Manufacturing in Silicon and III-V Materials
MEMS Design and Fabrication: Electrical, Optical, & Sensing Devices
Fiber Optic Device Design and Fabrication
Integrated Optics & Electro-Optical Devices
Plasma Physics

Specialized Training:

Global Positioning Electronics, Systems and Components
Six Sigma Semiconductor Manufacturing
Microwave Engineering
US Patent Law in Technology
Patent Application and Prosecution
Semiconductor Plasma Processing
Thin Film Physics and Technology
MEMS-based Gyroscopes and Accelerometers
Thermoelectric Materials & Technology
Phased Array Radar Engineering
Antennas and Electromagnetic Propagation
Solid State Optical Devices
Fiber Optic Communication System Operation
HALT and HAST Reliability Testing Methods

Hands-On Professional Expertise:

Semiconductor Physics & Chemistry
Semiconductor Fabrication: Silicon and III-V Materials
Semiconductor Device & Integrated Circuit Engineering
Semiconductor Equipment: Front & Back End
Semiconductor Packaging Design and Manufacturing
Passive Component Design and Manufacturing
RF Design and Fabrication
Digital Design & Fabrication
Semiconductor Manufacturing in Silicon and III-V Materials
MEMS Design and Fabrication: Electrical, Optical, & Sensing Devices
Fiber Optic Device Design and Fabrication
Integrated Optics & Electro-Optical Devices
Plasma Physics

(Ex. 1002 at 71.)

Dr. Shanfield's Experience

Stanley Shanfield



Curriculum Vitae for Stanley Shanfield

Education:

Massachusetts Institute of Technology, Ph.D., Physics, 1981

University of California, Irvine, B.S. Cum Laude, Physics, 1977

Educational Awards:

Outstanding Research Project, U.C. Regents Award, 1977

Phi Beta Kappa, 1977

Four Year Scholarship, Tuition & Research, ERDA/DOE, 1977-1981

Hands-On Professional Expertise:

Semiconductor Physics & Chemistry
Semiconductor Fabrication: Silicon and III-V Materials
Semiconductor Device & Integrated Circuit Engineering
Semiconductor Equipment: Front & Back End
Semiconductor Packaging Design and Manufacturing
Passive Component Design and Manufacturing
RF Design and Fabrication
Digital Design & Fabrication
Semiconductor Manufacturing in Silicon and III-V Materials
MEMS Design and Fabrication: Electrical, Optical, & Sensing Devices
Fiber Optic Device Design and Fabrication
Integrated Optics & Electro-Optical Devices
Plasma Physics

Specialized Training:

Global Positioning Electronics, Systems and Components
Six Sigma Semiconductor Manufacturing
Microwave Engineering
US Patent Law in Technology
Patent Application and Prosecution
Semiconductor Plasma Processing
Thin Film Physics and Technology
MEMS-based Gyroscopes and Accelerometers
Thermoelectric Materials & Technology
Phased Array Radar Engineering
Antennas and Electromagnetic Propagation
Solid State Optical Devices
Fiber Optic Communication System Operation
HALT and HAST Reliability Testing Methods

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Semiconductor Plasma Processing
Thin Film Physics and Technology
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Thermoelectric Materials & Technology
Phased Array Radar Engineering
Antennas and Electromagnetic Propagation
Solid State Optical Devices
Fiber Optic Communication System Operation
HALT and HAST Reliability Testing Methods

(Ex. 1002 at 71.)

Dr. Shanfield's Experience with CMP Pad Conditioning

- Dr. Shanfield lacks experience in CMP pad conditioning, which is the technical field of the '270 patent.
- Dr. Shanfield admits that he has never measured the number of diamonds on a CMP pad conditioner or inspected a CMP pad conditioner using an electron microscope.
- At best, Dr. Shanfield has worked in a lab where CMP equipment was present.

(Paper 20 at 3-4; Paper 34 at 2-3.)

Motion to Exclude - Dr. Shanfield's Declaration

- Understanding issues such as whether it was practically achievable to manufacture a BDD CMP pad dresser having superabrasive particle tip height variation of less than 50 microns in the 2005-2007 timeframe depends on a knowledge of CMP pad design and measurement during that time period. (Paper 32 at 5; *citing* Ex. 2004 at ¶¶31-32.)
- If Dr. Shanfield is qualified, then so is lead counsel, Alex Chan (Paper 27 at 25; Paper 32 at 3-4.)
- If Dr. Shanfield is qualified, then why didn't he rebut Dr. Tsai? (Paper 32 at 6-7.)
- Dr. Shanfield has never studied nor conducted any research or experiment specific to CMP pad conditioners. (Paper 32 at 7.)

- Not so much as a pin cite.
- Used only during deposition to elicit testimony.
- Late, needlessly cumulative, waste of time.

(Paper 34 at 5.)

- Ex. 1052 is a reference to support Petitioners' POSITA definition
- Ex. 1053 is used in a separate IPR and is irrelevant.
 - Not prior art
 - Not comparable to references here
 - Used only to confuse issues
- Late, irrelevant, misleading, confusing, waste of time.

(Paper 34 at 5.)

**Ground 2: Chou in view of Sung '479 and
SungECS Does Not Render Obvious Claims 6, 7
&**

**Ground 3: Chou in view of Sung '479 and
Goers Does Not Render Obvious Claim 2**

- Petitioner's conclusory statements that it would have been obvious that protruding tips of "tens of thousands of diamond particles," as allegedly shown in SungECS, would fall within a designated profile does not remedy the deficiencies of Chou and Sung '479 with respect to claim 1.
(Paper 20 at 34.)
- Petitioner's conclusory statements that it would have been obvious to combine Goers with Chou and Sung '479 to create a CMP pad dresser with a central, particle-free zone does not remedy the deficiencies of Chou and Sung '479 with respect to claim 1.
(Paper 20 at 35.)

Thank You

Backup Slides

Collateral Estoppel

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Collateral Estoppel

- Collateral estoppel “requires that the issues of patentability be identical,” which is a “legal conclusion based on underlying facts.” *Google LLC v. Hammond Dev. Int’l, Inc.*, 54 F.4th 1377, 1381 (Fed. Cir. 2022); (Paper 20 at 18-19.)
- The ’699 patent claims do not contain Element [1B] or any equivalent thereto.
- Petitioners agree. (Paper 5 at 28 n.7.)
- Petitioners admit that Chou does not teach Element [1B]. (Paper 5 at 30.)
- Petitioners’ invalidity arguments required adding Sung ’479.
 - ➔ Issues of patentability are not identical. (Paper 20 at 20.)
- In *Keysight*, (1) the patent-at-issue was a CON of the invalidated patent and shared the same disclosure; and (2) PO failed to challenge the estoppel argument.
 - Here, (1) the ’270 patent and invalidated ’699 patent are unrelated and have different disclosures (compare EX1001 with EX2011); and (2) PO does challenge. (Paper 27 at 6-7.)

Petitioners Use Impermissible Hindsight

Petitioners Use Impermissible Hindsight

- Sung'479's numeric values were not achievable
- Petitioners do not explain why any “trivial modification” of leveling the heights of Chou's particles to micron-precision would have given a POSITA motivation to combine in that particular fashion
- Petitioners give no indication how a POSITA would have combined the “designated profile” aspects of Sung'479 with Chou's two-sided grinding tool with a reasonable expectation of success or why the results of the combination would be predictable

(Paper 20 at 32-33; Paper 27 at 19-20.)

Petitioners Use Impermissible Hindsight

- “[O]nly through hindsight would a POSITA have been able to have selected from the among the potentially infinite combinations of parameters relating to
[1] the distinct embodiments described in Sung ’479 (including designated profile shape ([0070]-[0071]),
[2] the 13 specific permitted variations from the tip profile ([0072]), and
[3] wide ranges of particle size ([0057], [0073])) to form the one particular combination that is purported to satisfy claim element [1B].”
- “Neither Petitioners nor their expert disclose how or why that one particular combination would be chosen among the combination of parameters.”

(Declaration of Dr. Tsai, Ex. 2004 at ¶72; *see also* Paper 27 at 20.)

Outline Slides

- I. Background
- II. Ground 1: The Combination of Chou and Sung '479
- III. Samsung's Unqualified Expert &
PO's Motion to Exclude
- IV. Grounds 2-3

Important Considerations

- “[T]he burden of persuasion is on the petitioner to prove ‘unpatentability by a preponderance of the evidence,’ 35 U.S.C. § 316(e), and that burden never shifts to the patentee.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1375 (Fed. Cir. 2016).
- “[A] standalone § 103 reference must enable the portions of its disclosure being relied upon.” *Raytheon Techs. Corp. v. GE*, 993 F.3d 1374, 1380 (Fed. Cir. 2021).
- Sung’479 Is Not Enabling for Petitioners’ Purpose
- Chou and Sung’479 Do Not Disclose Claim 1
- No Motivation to Combine Chou and Sung’479

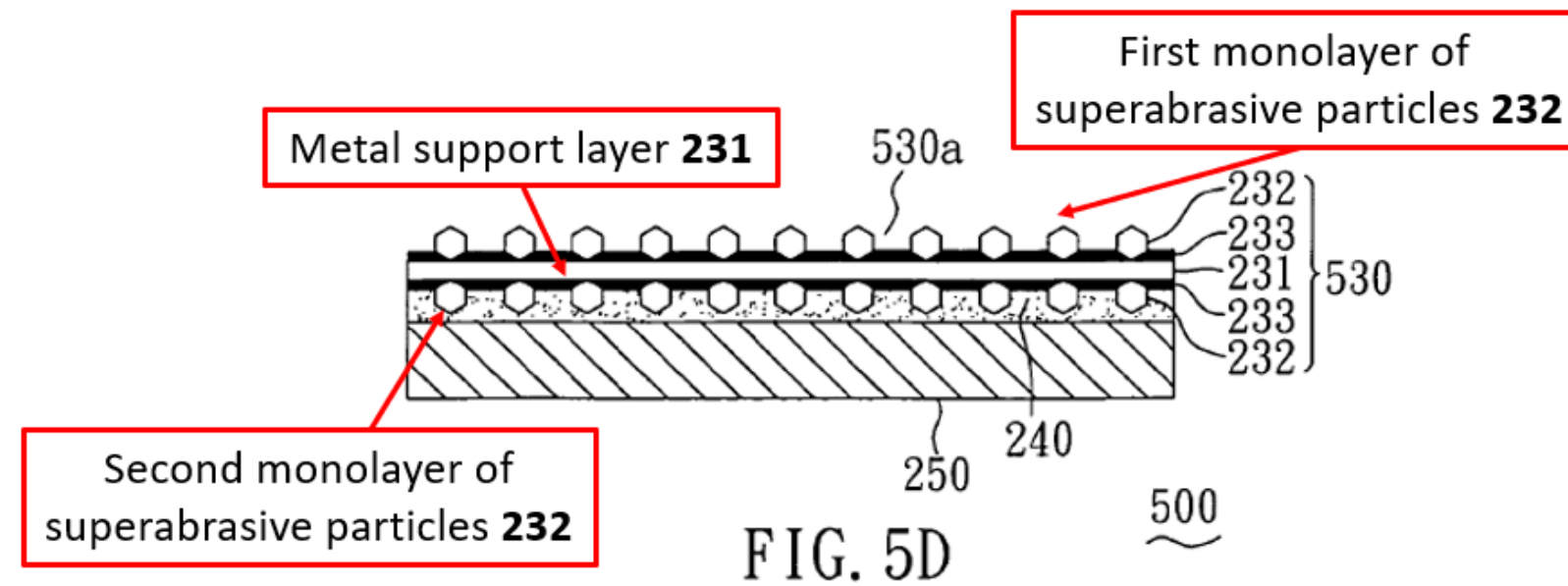
Sung'479 Is NOT Enabling for Element [1B]

- A. Sung'479's Numeric Values Unachievable (Paper 20 at 23, 28-29, 32.)
- B. Different and Non-overlapping Brazing Conditions (Paper 20 at 21.)
 - Sung'479 and Chou Use Low-temp Braze <700C
 - '270 Patent Uses 700-1200C
- C. Undefined Terminology (Paper 20 at 22-24.)
 - “Leveling Surface”, “Designated Profile”, “Spacer Layer”, “RA values”
- D. Undefined Double-sided Leveling (Paper 20 at 24-25.)
- E. No Working Examples or Prototypes (Paper 20 at 25.)
- F. PO Refuted Presumption of Enablement (Paper 27 at 8-9.)
- G. The '786 Application Is Irrelevant (Paper 27 at 10-11.)
- H. Nothing Is Rebutted

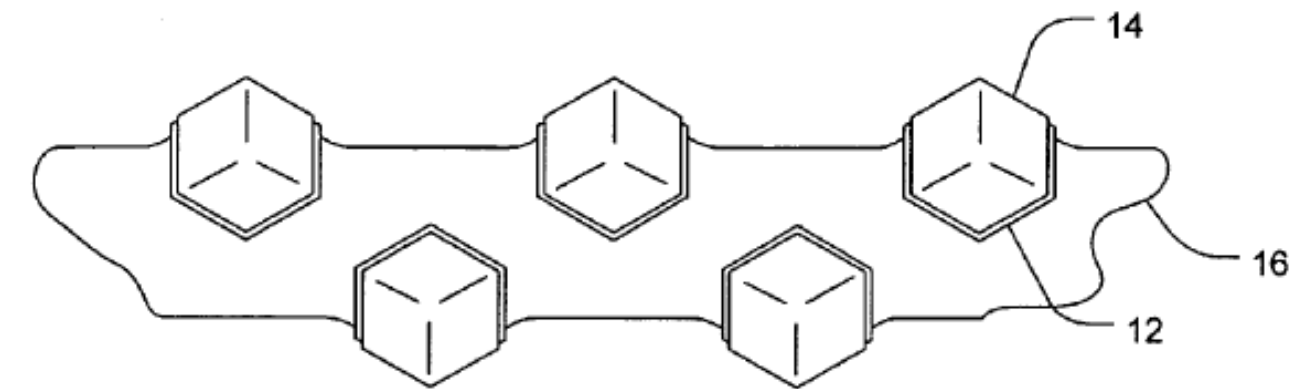
Chou and Sung'479 Do Not Teach Element [1B]

- A. The Institution Decision Is Not Final (Paper 27 at 14-15.)
 - *TriVascular, Inc. v. Samuels*, 812 F.3d at 1068.
- B. Sung'479's Numeric Values Were Unachievable (Paper 20 at 23, 28-29, 32) & Chou Has None (Paper 27 at 15)
 - Dr. Tsai Confirmed
 - Chou "Precisely Controlled" Height w/o Example
- C. No Motivation to Combine Chou and Sung'479 (Paper 20 at 29-33.)
 - Chou Already Solved Warping Problem
- D. Chou and Sung'479 Are Incompatible (Paper 20 at 32-33.)
 - Different Two-sided Structures
 - Grinding Plate/No Grinding Plate, No Spacer Layer/Spacer Layer
 - Different Binding Materials
- E. The '270 Patent Uses Different Brazing (Paper 20 at 31-33; Paper 27 at 21-22.)

Chou and Sung'479 Do Not Teach Element [1B]



(Chou)



(Sung'479)

Petitioners Use Impermissible Hindsight

- Sung'479's numeric values were not achievable
- Petitioners do not explain why any “trivial modification” of leveling the heights of Chou's particles to micron-precision would have given a POSITA motivation to combine in that particular fashion
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Petitioners Use Impermissible Hindsight

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[1] the distinct embodiments described in Sung ’479 (including designated profile shape ([0070]-[0071]),
[2] the 13 specific permitted variations from the tip profile ([0072]), and
[3] wide ranges of particle size ([0057], [0073])) to form the one particular combination that is purported to satisfy claim element [1B].”
- “Neither Petitioners nor their expert disclose how or why that one particular combination would be chosen among the combination of parameters.”

(Declaration of Dr. Tsai, Ex. 2004 at ¶72; *see also* Paper 27 at 20.)

Level of Skill In the Art

- A POSITA for purposes of the '270 patent includes at least two years of experience in developing CMP technology including experience with the design and development of CMP pad dressers.
- Specific experience with CMP pad conditioners is necessary due to the particularized context of this distinct technical field which requires knowledge of:
 - abrasive materials,
 - mechanical wear mechanisms,
 - pad/wafer interaction physics,
 - performance optimization of pad conditioners.
- General expertise in semiconductor manufacturing is insufficient.

(Paper 20 at 3; See EX1051, 171:7-172:3, 214:17-215:21; Paper 32 at 3-7.)

Conclusion

- “[T]he burden of persuasion is on the petitioner to prove ‘unpatentability by a preponderance of the evidence,’ 35 U.S.C. § 316(e), and that burden never shifts to the patentee.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1375 (Fed. Cir. 2016).
- Sung’479 Is Not Enabling for Element [1B]
- Chou and Sung’479 Do Not Disclose Claim 1
- No Motivation or Expectation of Success to Combine Chou and Sung’479
- Patentability of Claims 1-8 Should Be Confirmed

Case IPR2024-00533
Patent No. 8,974,270
Patent Owner's Demonstratives

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), the undersigned certifies that on June 16, 2025, the foregoing document is being served via electronic mail upon the following counsel of record for Petitioners:

LEAD COUNSEL	BACKUP COUNSEL
Yung-Hoon Ha (Reg. No. 56,368) Desmarais LLP 230 Park Ave New York, NY 10169 Telephone: (212) 351-3400 Email: yha@desmaraisllp.com	Laura Avena (Reg. No. 78,920) Desmarais LLP 230 Park Ave New York, NY 10169 Telephone: (212) 351-3400 Email: lavena@desmaraisllp.com Taeg Sang Cho (Reg. No. 69,618) Desmarais LLP 230 Park Ave New York, NY 10169 Telephone: (212) 351-3400 Email: tcho@desmaraisllp.com Bridget Belcher (Reg. No. 82,861) Desmarais LLP 101 California Street San Francisco, CA 94111 Telephone: (415) 573-1900 Email: bbelcher@desmaraisllp.com
Additional email for service: SamsungSungIPRService@desmaraisllp.com	

/ Alex Chan /
Alex Chan
Reg. No. 52,713