UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INNOSCIENCE (ZHUHAI) TECHNOLOGY COMPANY, LTD.,
AND
INNOSCIENCE AMERICA, INC.
Petitioner,

v.

EFFICIENT POWER CONVERSION CORPORATION,
Patent Owner

Case IPR2023-01384
U.S. Patent No. 10,312,335

PATENT OWNER'S SUR-REPLY TO PETITIONER'S PRELIMINARY REPLY

I. HORIZONTAL LEDGES OF "SUBSTANTIALLY EQUAL WIDTHS" IS A PRECISE PROPORTION OR SIZE

Petitioner argues that Patent Owner mischaracterizes *Hockerson-Halberstadt, Inc. v. Avia Group. Int'l, Inc.,* which stands for the proposition that patent drawings do not define the precise proportions of the elements. Reply at 1. Notably, Petitioner broadly asserts that *Hockerson* does not extend to "relative dimensions, terms of degree and approximation," Reply at 2, without regard to precision or size. Petitioner is wrong.

Although it is true that claimed shapes and relative dimensions can be gleaned from patent drawings in some limited circumstances, *Hockerson* applies if the claim term requires "precise proportions" or "particular sizes" that cannot be gleaned from a patent drawing. *See Hockerson-Halberstadt, Inc. v. Avia Group. Int'l, Inc.*, 222 F.3d 951,956 (Fed. Cir. 2000). That is the case here.

The present case relates to transistor dimensions, i.e., specifically whether the ledges in a transistor gate - which are *nanometers* in width - are substantially equal. Such incredibly small widths cannot possibly be depicted in patent drawings. There is absolutely no way to glean from the drawings in *Saxler* and *Yoshida* whether the horizontal ledges in those references "have substantially equal widths" as claimed.

Indeed, the teachings of the '335 patent make it clear that the ledges of *Saxler* and *Yoshida*, which are formed with multiple masks (rather than self-

aligned ledges formed with a single mask), **cannot** have substantially equal widths. As noted in the '335 patent, when multiple masks are used to form ledges, misalignment is a significant disadvantage:

> [T]he self-aligned process illustrated in FIGS. 6A-6C is vastly superior to forming gate ledges using separate masks. In the process of using separate masks, a photoresist mask is applied to the unetched structure after the p-type gate material is deposited on the barrier layer of the device. In this instance, the first mask is used to pattern and etch the gate metal to a minimum CD. A second mask is then used to pattern and etch the p-type material with a wider CD than the gate metal. One significant disadvantage of this two mask process is the possibility of misalignment between the gate metal and the p-type gate material.

'335 patent at 4:52-63. Conversely, when the gate structure is self-aligned in the manner described and claimed in the '335 patent, the ledges have equal or substantially equal widths, which is otherwise not possible.

> The pair of ledges 506 that extend past sidewalls of the gate metal 504 have equal or **substantially equal widths**, i.e., the respective ledges are symmetric from the respective sidewalls of the gate metal to the side surfaces of the p-type gate material, which is **due to the self-aligned manufacturing process**.

'335 patent at 3:59-64 (emphasis added).

Accordingly, contrary to Petitioner's assertion, *Hockerson* is directly applicable to this case, because the claim limitation "substantially equal widths" relates to a **precise** dimension - the microscopic width of a transistor gate ledge – which cannot possibly be drawn to scale in a patent drawing.

II. A PERSON SKILLED IN THE ART WOULD HAVE NO REASON OR MOTIVATION TO COMBINE *SHENOY*'S TEACHINGS WITH *SAXLER*, *YOSHIDA* OR *BEACH*

Petitioner asserts that *Shenoy* is analogous art because "*Shenoy* addresses the same field of endeavor and provides solutions for achieving the gate structure of the '335 patent." Reply at 1. Tellingly, Petitioner attacks the "analogous art" label of Section VII.B. on page 38 of Patent Owner's Preliminary Response, but presents no *substantive argument* as why one skilled in the art would have considered *Shenoy* to modify the teachings of *Saxler*, *Yoshida* or *Beach*.

Shenoy involves electrochemical etching – etching with an applied voltage, an applied electric field, and an electrical current flowing. However, because *Saxler* does not describe the conductivity of its materials, a POSA would not have considered *Shenoy* to modify the teachings of *Saxler*, because *Shenoy* describes electrochemical etching, a highly specialized etching method with little relevance to the process described in either the '335 Patent or *Saxler*. Indeed, electrochemical etching can only be used in conjunction with conductive materials, and therefore would not have been considered based upon the KOH etching described in *Saxler*.

Although *Shenoy* generally describes an isotropic etching process, a POSA would not have considered the materials used and the structure etched in *Shenoy* to be related to either *Saxler* or *Beach*. First, *Shenoy* does not address self-alignment

or how to etch a material below a hard mask. Instead, *Shenoy* solely addresses the verticality of the photoresist during etching and its effect on the resulting EEM etching process. And second, *Shenoy* does not address materials relevant to *Saxler* and therefore any etching process would have been significantly different from the etching process proposed by *Saxler* and not considered as a substitution. Indeed, a POSA would have recognized that an unduly significant amount of experimentation would be required to attempt *Shenoy*'s etching process in *Saxler* (with no expectation of success) and for this reason a POSA would not have sought to apply the EEM process of *Shenoy* to *Saxler*. Therefore, although *Shenoy* describes isotropic etching, its technology and the application are substantially different from *Saxler* and would not have been considered by a POSA.

III. CONCLUSION

For the foregoing reasons and those submitted in Patent Owner's Preliminary Response, Petitioner's challenge is deficient and *inter partes* review should not be instituted.

Dated: January 30, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned certifies that a true and correct copy of the foregoing **PATENT OWNER'S SUR-REPLY TO PETITIONER'S PRELIMINARY REPLY** is being served on counsel of record by filing this document through the Patent Review Processing System, with a copy served via electronic mail to the following email address, as authorized in the Petition:

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Dated: January 30, 2024 Respectfully submitted,

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