

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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AXION BIOSYSTEMS, INC.,  
Petitioner,

v.

AGILENT TECHNOLOGIES, INC.,  
Patent Owner.

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IPR2024-01467  
Patent 11,906,508 B2

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Before GEORGIANNA W. BRADEN, DAVID COTTA, and  
MICHAEL A. VALEK, *Administrative Patent Judges*.

COTTA, *Administrative Patent Judge*.

JUDGMENT  
Final Written Decision  
Determining No Challenged Claims Unpatentable  
Granting Petitioner's Motion to Strike  
*35 U.S.C. § 318(a)*

## I. INTRODUCTION

Axion BioSystems, Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”), seeking *inter partes* review of claims 1–30 of U.S. Patent No. 11,906,508 B2 (Ex. 1001, “the ’508 patent”). Agilent Technologies, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). Prior to institution, Patent Owner statutorily disclaimed claims 9, 10, and 23–30. Prelim. Resp. 6 (citing Ex. 2001 (disclaimer dated Dec. 20, 2024)). Upon finding the Petition demonstrated a reasonable likelihood that Petitioner would prevail in demonstrating unpatentability of at least one of the remaining challenged claims, we instituted review. *See* Paper 9, 21 (“DI”) (finding burden met for claims 16–22).

After institution, Patent Owner filed a Patent Owner Response. Paper 12 (“PO Resp.”). In its Response, Patent Owner states that it has “statutorily disclaimed Claims 16–22 of the ’508 patent.” PO Resp. 1 (citing Ex. 2020 (disclaimer dated June 19, 2025)). Accordingly, Petitioner’s challenge to the patentability of claims 16–22 is now moot, leaving only Petitioner’s challenge to claims 1–8 and 11–15 at issue in this proceeding.

Petitioner filed a Reply to the Patent Owner Response (Paper 18, “Reply”) and Patent Owner filed a Sur-reply (Paper 21, “PO Sur-reply”). With our authorization, Petitioner also filed a motion to strike (Paper 28, “Mot.”) and Patent Owner opposed the motion (Paper 29, “Opp. Mot.”).

An oral hearing was held on December 12, 2025, and a transcript of the hearing is included in the record. Paper 34 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of the remaining challenged claims, i.e., claims 1–8 and 11–15, of the ’508 patent.

For the reasons discussed below, we hold that Petitioner has not demonstrated by a preponderance of the evidence that claims 1–8 and 11–15 are unpatentable.

## II. BACKGROUND

### *A. Real Parties-in-Interest*

The parties identify themselves as the real parties-in-interest. Pet. 83; Paper 4, 1.

### *B. Related Matters*

The parties identify *Agilent Technologies, Inc. v. Axion BioSystems, Inc.*, 1:24-cv-00300 (D. Del.) as a related matter involving the ’508 patent. Pet. 84; Paper 4, 1.

### *C. The ’508 Patent*

The ’508 patent issued on February 20, 2024, and claims priority to a series of applications, the earliest of which was filed on May 5, 2008. Ex. 1001, codes (45), (60).

The ’508 patent generally describes “[a] system for monitoring cells, which includes a device for monitoring cell-substrate impedance, the device having a plurality of wells on a nonconductive substrate” where each well has an electrode array for measuring the cell-substrate impedance. Ex. 1001, Abstr. “[E]lectronic circuitry with multiple analogue-to-digital conversion channels” connects the electrode arrays to an “impedance analyzer” that measures the impedance over time. *Id.* The system further includes “a software program that controls the electronic circuitry and records and analyzes data obtained from the impedance analyzer.” *Id.* at 3:11–13.

At least some embodiments of this system provide impedance monitoring at “millisecond time resolution.” Ex. 1001, 3:44–45. In a subsection titled “Definitions,” the Specification explains that:

As used herein, “impedance measurement at millisecond time resolution” refers to the ability to perform a series of at least two consecutive impedance measurements within milliseconds of one another for each and every well of the system where each well is associated with an electrode array for impedance measurement. In each instance the time between two consecutive impedance measurements are less than 300 milliseconds from one another.

*Id.* at 9:34, 10:8–15. Elsewhere the Specification notes that “required or desired time resolution may vary” and “[i]n some embodiments 500 millisecond time resolution is sufficient, such that at least two consecutive impedance measurements are between about 300 milliseconds and about 500 milliseconds apart.” *Id.* at 23:47–55; *see also id.* at 24:35–39 (similar).

#### *D. Challenged Claims*

After Patent Owner’s statutory disclaimers, the remaining challenged claims are claims 1–8 and 11–15. Independent claim 1 is reproduced below, reformatted with the designations Petitioner uses to identify limitations shown in brackets.

1. [Preamble] An apparatus for continuous, label free, real-time monitoring of cells using impedance-based analysis, the apparatus comprising:

[Element 1] a) a multiwell plate comprising a plurality of wells on a nonconductive substrate,

[Element 2] wherein each of the plurality of wells comprises an electrode array of a plurality of electrode arrays that is disposed on the nonconductive substrate;

[Element 3] b) an impedance analyzer that independently measures a cell-substrate impedance at each well,

[Element 4] the cell-substrate impedance being measured between a first electrode structure and a second electrode structure of the electrode array and across a cellular sample comprising a plurality of cells disposed within each well,

[Element 5] the impedance analyzer including at least two analogue-to-digital conversion channels coupled to the plurality of electrode arrays,

[Element 6] wherein the impedance analyzer monitors the electrode arrays at millisecond time resolution between first measurements of the cell-substrate impedance and second measurements of the cell-substrate impedance for each well; and

[Element 7] c) a software program that analyzes the first measurements and the second measurements to produce a time period analysis of the cellular sample.

Ex. 1001, 46:65–47:21. Claims 2–8 and 11–15 depend from and thus incorporate the limitations of claim 1, including element 6.

#### *E. Asserted Challenges to Patentability*

Petitioner’s challenge alleging that claims 23–30 are anticipated by Xu-752<sup>1</sup> is moot in light of Patent Owner’s disclaimer of those claims. *See* Pet. 1; PO Resp. 1; Ex. 2001 (disclaimer). Claims 9, 10, and 16–22 have also been disclaimed. PO Resp. 1; Ex. 2020 (second disclaimer).

Therefore, the only remaining challenge is the following.

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<sup>1</sup> US 7,192,752 B2, issued Mar. 20, 2007 (Ex. 1005) (“Xu-752”).

| Claim(s) Challenged | 35 U.S.C. § <sup>2</sup> | Reference(s)/Basis         |
|---------------------|--------------------------|----------------------------|
| 1–8, 11–15          | 103(a)                   | Xu-752, Jones <sup>3</sup> |

In addition to other record evidence, Petitioner offers the declaration of Bruce C. Kim, Ph.D. (Ex. 1003) in support of this challenge. Patent Owner offers the declaration of Benjamin Sanchez Terrones, Ph.D. (Ex. 2009) with its Response.

### III. ANALYSIS OF PETITIONER’S CHALLENGE

#### *A. Legal Standard*

Under the pre-AIA version of § 103(a), a claim is unpatentable for obviousness if, to one of ordinary skill in the pertinent art, “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made.” 35 U.S.C. § 103(a) (2006); *see also KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

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<sup>2</sup> The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), included revisions to 35 U.S.C. § 103 that became effective after the filing of the applications to which the ’508 patent claims priority. Therefore, we apply the pre-AIA version of § 103.

<sup>3</sup> US 2007/0057680 A1, published Mar. 15, 2007 (Ex. 1006) (“Jones”).

*B. Level of Ordinary Skill in the Art*

Petitioner contends a person of ordinary skill in the art (“POSA”) as of May 2009 “would have had a B.S. in electrical/mechanical/biomedical engineering or biological science, or a related field, and approximately 2 years of relevant experience or equivalent study in systems and methods for bioanalysis of cells.” Pet. 14 (citing Ex. 1003 ¶¶ 23–25). Patent Owner adopts this definition for purposes of this proceeding. PO Resp. 9 (citing Ex. 2009 ¶ 19). We find Petitioner’s description of the level of ordinary skill in the art to be consistent with the level of skill reflected in the ’508 patent and in the prior art of record. Accordingly, we apply Petitioner’s definition in this decision.

*C. Claim Construction*

In an *inter partes* review, claim terms “shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b).

We begin by considering construction of the claim term “millisecond time resolution.” The ’508 patent includes a “Definitions” section that provides express definitions for many terms. Ex. 1001, 9:34–16:14. Among the definitions provided is the following definition for the term, “millisecond time resolution.”

As used herein, “impedance measurement at millisecond time resolution” refers to the ability to perform a series of at least two consecutive impedance measurements within milliseconds

of one another for each and every well of the system where each well is associated with an electrode array for impedance measurement. In each instance the time between two consecutive impedance measurements are less than 300 milliseconds from one another.

*Id.* at 10:8–15. There does not appear to be any dispute as to the definitional nature of the first sentence in the passage above. That is, the parties agree that millisecond time resolution should be construed to mean: “the time between two consecutive impedance measurements for each and every well being evaluated in the claimed apparatus or system.” PO Resp. 15 (proposing construction); Pet. Reply. 23 (“Axion also agrees that the term ‘millisecond time resolution’ is ‘the time between two consecutive impedance measurements for each and every well being evaluated in the claimed apparatus or system.’”).

The parties also agree that we do not need to determine whether the time interval between two consecutive impedance measurements is less than 300 milliseconds, as set forth in the definition portion of the specification, or whether it can be met by some other time interval, as suggested by other portions of the specification. *See e.g.*, Ex. 1001, 23:49–55 (explaining that “[i]n some embodiments 500 millisecond time resolution is sufficient”), 24:37–39 (similar); PO Resp. 15 (arguing that “the distinction between 300 milliseconds and 500 milliseconds is immaterial to the dispute in this IPR because Jones teaches a 1.5 second update period, thus at least three times longer than the 500 milliseconds formulation”); Pet. Reply 23–24 (section headed “[Petitioner] Agrees That, In This IPR, The 300 Versus 500 Milliseconds Distinction is Immaterial To Addressing the Unpatentability of the Challenged Claims”), *see also*, Pet. Reply 24–26 (asserting that the claims are indefinite because it is not clear whether they require a 300 or a

500 millisecond time interval, but arguing that “the claims’ unpatentability can be determined without resolving the 300 versus 500 milliseconds indefiniteness issue”).

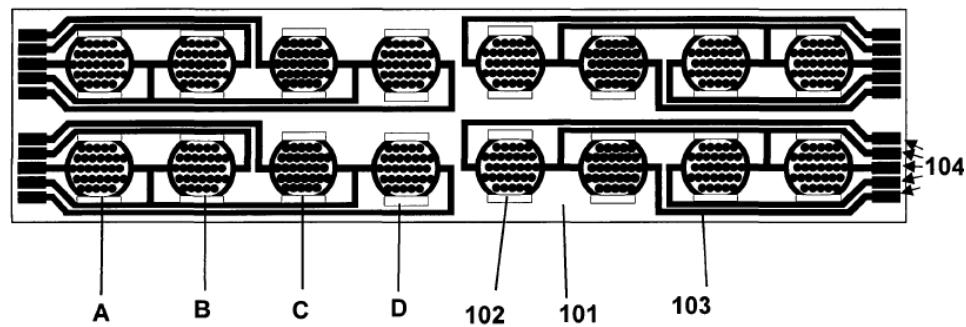
We agree with the parties that “millisecond time resolution” should be construed to mean: “the time between two consecutive impedance measurements for each and every well being evaluated in the claimed apparatus or system.” PO Resp. 15; Pet. Reply. 23. We further agree that resolution of this case does not require that we determine whether the period between two consecutive impedance measurements is less than 300 or less than 500 milliseconds because Petitioner has not carried its burden under either time interval.

#### *D. Asserted References*

##### *i. Xu-752*

Xu-752 is a patent issued on March 20, 2007. Ex. 1005, code (45). Petitioner asserts, and Patent Owner does not dispute, that Xu-752 qualifies as prior art under 35 U.S.C. § 102(b). Pet. 2.

Xu-752 discloses systems and devices “for assaying cells using cell-substrate impedance monitoring.” Ex. 1005, code (57). Xu-752’s system comprises “one or more cell-substrate monitoring devices comprising multiple wells each having an electrode array, an impedance analyzer, a device station that connects arrays of individual wells to the impedance analyzer, and software for controlling the device station and impedance analyzer.” *Id.* Figure 1A of Xu-752, reproduced below, is a schematic drawing of the cell-substrate impedance measurement device.



The embodiment shown in Figure 1A above has 16 electrode arrays 102 arranged in a 2-row by 8-column configuration on glass substrate 101. *Id.* at 7:20–24; 19:35–40. “The substrate of the device has a surface suitable for cell attachment or growth,” which “can result in a detectable change in impedance between or among the electrode structures within each electrode array.” *Id.* at 4:8–12.

“The device is assembled such that a single array of the substrate is at the bottom of a receptacle or well” and “associated with a well of a multi-well plate.” Ex. 1005, 21:29–33. Figure 4 of Xu-752, reproduced below, depicts multiple cell-substrate impedance measurement devices in a device station.

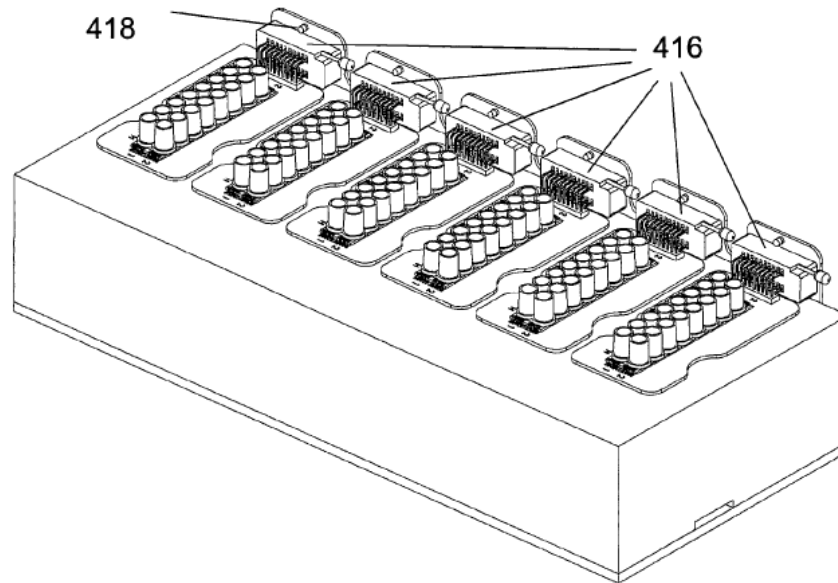


Figure 4 above is an illustration showing six devices each having 16 wells connected to the station through sockets 416. *See id.* at 24:13–24. The station comprises electronic circuitry that connects the electrode arrays in each individual well to an impedance analyzer. *Id.* at 23:44–48, 24:13–24.

Software directs switches in the device station to connect arrays to the impedance analyzer and monitor impedance over time in a given well. *See* Ex. 1005, 23:48–62 (“Preferably, impedance monitoring is performed at more than one time point for a given assay.”). According to Xu-752, “[t]he device station can connect individual arrays of a device to an impedance analyzer to monitor one, some, or all of the arrays of a device for a measurement time point” and selected arrays can “be monitored in rapid succession for each desired monitoring time point.” *Id.* at 23:57–62. Xu-752 further teaches that “the device station software is programmable to direct impedance monitoring of any of the wells of the device that comprise arrays at chosen time intervals.” *Id.* at 23:66–24:2; *see also* Fig. 6, 7:38–55

(showing and describing “pages from real-time cell electronic sensing software”).

*ii. Jones*

Jones is a patent application publication published on March 15, 2007. Ex. 1006, code (43). Petitioner asserts, and Patent Owner does not dispute, that Jones qualifies as prior art under 35 U.S.C. § 102(b). Pet. 2.

Jones discloses an “Impedance Measurement System (ZMS) for measuring the complex impedance of each well of a single well or multiwell microtiter plate utilizing a novel combination of parallel impedance measurement channels, multiplexing, and reference impedance networks.” Ex. 1006, code (57), ¶ 3. According to Jones, its “system can be used for impedance measurements of varying time periods, single or multiple frequencies, and various measurements rates” and “employs parallelism to obtain the required throughput at the repeatability required.” *Id.* ¶ 3.

In Jones’s system, “each row of sensors on a microtiter plate is addressed by measurement circuitry (in the form of analog signal conditioning circuits, multiplexing circuits, analog-digital converters, and digital signal processors) on a single daughter board.” Ex. 1006 ¶¶ 12, 18 (teaching that “daughter boards carry the electronic components to drive and process a row of wells” and “may be equipped with multiple analog-to-digital converters”). The “ZMS daughter boards mate” with a “mother board [that] processes the impedance measurement data, at a specific time and frequency, of all wells of the microtiter plate and communicates the results to the system controller.” *Id.* ¶ 20.

Jones teaches that “[e]ach well is subject to a stepped sweep (a series of single frequency bursts-one burst for each selected frequency.” Ex. 1006

¶ 30. Jones explains that:

From preliminary modeling and testing, no more than 68.2 ms per well for all frequencies is required to obtain sufficient samples. For an embodiment in which [sic] a 96 well plate with 12 wells per row plus four reference network channels, calculations to determine sufficient samples suggest a 1091 mS measurement period, leaving 409 mS for multiplexer switching and signal setting within the target 1.5 second update period.

*Id.*

*E. Alleged Obviousness over Xu-752 and Jones*

Petitioner contends that claims 1–8 and 11–15 would have been obvious over Xu-752 and Jones. *See* Pet. 31–66. In particular, Petitioner argues that “Xu-752 describes the combination of every structural component in [these claims] except for ADCs [i.e., analog-to-digital converters<sup>4</sup>], and also describes the claimed functionality, except for sampling at ‘millisecond time resolution.’” *Id.* at 31. Petitioner asserts that Jones “describes an improved impedance measurement system that includes the limitations that Xu-752 does not explicitly describe” and that “a POSA would have been motivated to combine Xu-752 with Jones for several reasons.” *Id.* at 31–32.

This case turns on whether Petitioner has carried its burden to establish, by a preponderance of the evidence, that it would have been obvious to modify Xu-752 to have millisecond-time resolution. We begin

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<sup>4</sup> The Petition defines the term “ADC” to mean “analog-to-digital conversion.” Pet. 10.

by summarizing Petitioner's position. We then analyze Petitioner's showing in view of the arguments present by Patent Owner. For the reasons discussed below, we conclude that Petitioner has not carried its burden to establish that the millisecond-time resolution feature of claims 1–8 and 11–15 would have been obvious.

*i. Petitioner's position*

Petitioner argues that “Jones describes an impedance analyzer that can monitor electrode arrays in wells at millisecond-time resolution between two measurements of cell-substrate impedance for each well.” Pet. 53. Jones discloses one embodiment, a 96-well microtiter plate where the time between measurements is 1.5 seconds. Ex. 1006 ¶ 30. To support its statement that Jones discloses an “analyzer that can monitor electrode arrays in wells at millisecond-time resolution,” Petitioner relies on a series of calculations by its expert that use Jones' 96-well embodiment as a baseline to calculate what the time between measurements would be in microtiter plates that use, for example: fewer wells, fewer reference columns, more daughter boards, and a single rather than multiple measurement frequencies. Pet. 53 (citing Pet. § IV.B.1–2; *see* Ex. 1003 ¶¶ 69–75, 137–141).

In what it calls “one simple example,” of how it contends Jones discloses “millisecond time resolution,” Petitioner points to Dr. Kim's testimony (derived from calculations using Jones' 96-well embodiment as a baseline) that “a 16-well plate with an 8 x 2 configuration (such as in one of Xu-752 preferred plates) with Jones's exemplary impedance analyzer that uses three reference network channels and eight daughter boards” would take measurements in 470 milliseconds, “and thus a set of measurements would be made for all 16 wells of the plate in less than 500 milliseconds.”

*Id.* at 53–54 (citing Ex. 1003 ¶ 137).<sup>5</sup> As another example, Petitioner points to Dr. Kim’s testimony that taking measurements at a single frequency of 10 kHz in a “16-well plate with an 8 x 2 configuration . . . would take less than 136 milliseconds.” *Id.* at 54 (citing Ex. 1003 ¶¶ 138–140). According to Petitioner, Dr. Kim provides “several additional examples of how a POSA would use Jones’s impedance analyzer for impedance measurements with millisecond-time resolution between measurements to monitor multiple wells.” *Id.* at 54–55 (citing Ex. 1003 ¶¶ 69–75, 141, 169–177 (testimony from Dr. Kim including discussion of reducing the time interval between two consecutive measurements by, e.g., changing the daughter board configuration, reducing the number of wells, using higher frequencies for taking measurements, and reducing the number of reference channels)).

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<sup>5</sup> For comparison, Jones’ 96-well embodiment has 8 rows of 12 wells per row, and 4 reference channels. Ex. 1006 ¶ 30.

In its Reply, Petitioner provides a table, reproduced below, that illustrates how, in its view, varying Jones’s parameters can result in different millisecond time resolutions.

| EX1003 | Number of Wells | Number of Frequencies             | Daughter Boards | Reference Channels | Update Period |
|--------|-----------------|-----------------------------------|-----------------|--------------------|---------------|
| ¶72    | 96-well         | Single freq. (10, 50, or 100 kHz) | 8               | 4                  | 412-433 ms    |
| ¶137   | 16-well         | Multi-freq. sweep                 | 8               | 3                  | 470 ms        |
| ¶139   | 16-well         | Single freq. (10 kHz)             | 8               | 3                  | 136 ms        |
| ¶173   | 16-well         | Single freq. (10 kHz)             | 16              | 0                  | 1.5 ms        |
| ¶175   | 16-well         | Single freq. (10 kHz)             | 2               | 0                  | 55 ms         |

Reply 6. The above table includes six columns. The first indicates the paragraph, within Dr. Kim’s declaration, where relevant testimony can be found. The remaining columns are for “number of wells,” “number of frequencies,” “daughter boards,” “reference channels,” and “update period.” According to Petitioner’s table, the update period—i.e., millisecond time resolution—can be as low as 1.5 milliseconds (for a 16-well, single frequency (10 kHz) measurement using 2 daughter boards and 0 reference channels) and as high as 470 milliseconds (for a 16-well, multi frequency sweep using 8 daughter boards and 3 reference channels). Petitioner asserts that the examples in this table “show Jones’s capability for achieving a millisecond time resolution, including the fastest required by the challenged claims (i.e., ‘less than 5 milliseconds’ in claim 14).” *Id.*

As reflected below in an exchange at oral argument, Petitioner does not limit itself to a single configuration having a specific number of wells, daughter boards, reference channels, and measurement frequencies that it contends is disclosed or rendered obvious by Jones.

[Board]: . . . What is it exactly that you're contending would have been obvious in Jones in terms of number of frequency of measurements and number of wells, number of reference channels, number of daughter boards?

What is the exact configuration in putting it all together, to use your words, that you contend would have been obvious?

[Petitioner's counsel]: Well, there's no one single configuration, Your Honor.

Our argument is that if you have these known applications that require millisecond time resolution measurements, a POSA would've been motivated to use the parameters that are expressly described in Jones, in Xu-752, use those parameters to achieve those known applications. For example, if you want to study electroporation of cells, where things are happening on the scale of a few milliseconds, a POSA is going to know -- he's going to say, Jones has taught me I can use single or multiple frequencies; I can use different configurations of daughter boards; I can use different configurations of reference channels. That is how I'm going to get the measurement resolution I need to perform this known application.

So it's not proposing speed for speed's sake. It's not -- we didn't -- Dr. Kim didn't pluck parameters out of thin air. He's using the parameters that are described in the prior art references in saying that POSA will know how to configure the system to get the speeds that he needs.

Tr. 15:23–16:20; *see also, id.* at 18:1–19:12 (similar). Thus, Petitioner contends that Jones can be configured to have millisecond time resolution, and that the POSA would select among possible configurations as needed to achieve a desired time resolution.

Having asserted that Jones discloses configurations that could have the capacity for millisecond time resolution, Petitioner contends that it would have been obvious to “modify Xu-752’s system for monitoring cells using impedance-based analysis with an impedance analyzer, such as Jones’s device, having the claimed ADC and ‘millisecond time resolution’ features” because “[s]everal known applications of such impedance-based cell analysis systems involved monitoring cell behavior over time, including cell behavior known to occur in very short time windows (e.g., in milliseconds).” *Id.* at 36. As examples of known applications that require millisecond time resolution, Petitioner points to Ghosh<sup>6</sup> “studying cell pores formed by electroporabilization” by taking “data once every 10 milliseconds.” *Id.* at 37 (citing Ex. 1017, 1604; Ex. 1003 ¶¶ 110–111). Petitioner also points to Yu’s disclosure of using “cell-electrode impedance to measure minute changes in cellular morphology as a result of ligand-dependent GPCR activation” using instruments where measurements can be sampled in as little as 50 ms/well. *Id.* at 38 (citing Ex. 1008, 35–37; Ex. 1003 ¶ 112). Finally, Petitioner points to disclosures in Mohr,<sup>7</sup> Pancrazio,<sup>8</sup> and Heer<sup>9</sup> of studying the beating activity of cardiomyocytes

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<sup>6</sup> Ghosh et al., *Monitoring Electroporabilization in the plasma membrane of adherent mammalian cells*, Biophysical Journal, Vol. 64(5), 1602-1609 (May 1993) (Ex. 1017, “Ghosh”).

<sup>7</sup> Mohr et al., *Performance of a thin film microelectrode array for monitoring electrogenic cells in vitro*, Sensors and Actuators, B 34, 265-269 (1996) (Ex. 1018, “Mohr”).

<sup>8</sup> Pancrazio et al., *Portable cell-based biosensor system for toxin detection*, Sensors and Actuators, B 53, 179-185 (1998) (Ex. 1019, “Pancrazio”).

<sup>9</sup> Heer et al., *CMOS microelectrode array for the monitoring of electrogenic cells*, by Biosensors and Bioelectronics 20, 358-366 (March 2004) (Ex. 1021, “Heer”).

using millisecond-time resolution. *Id.* at 38–40 (citing Ex. 1018, 265; Ex. 1019, 184; Ex. 1021, 359–60, 364; Ex. 1022; Ex. 1023; Ex. 1003 ¶¶ 112–115). Petitioner summarizes:

In sum, there were applications of impedance-based cell analysis known to a POSA at the time of the '508 patent that used millisecond-time resolution between measurements, and further there were also specific cell behaviors (*e.g.*, cardiomyocyte beating activity) that were known to a POSA to occur in short time periods (*e.g.*, milliseconds), such that millisecond-time resolution for measurements would be necessary and/or advantageous for any cell analysis system used to monitor such behaviors. EX1003, ¶116. Thus, it would have been obvious to a POSA to implement Xu-752's impedance-based cell analysis system using an impedance analyzer that would “monitor[] the electrode arrays at millisecond time resolution,” as recited in claim 1.

*Id.* at 41.

In addition to the motivation to take measurements of cell behaviors known to occur in short time periods, Petitioner asserts that a POSA would have been motivated to use Jones' impedance analyzer in Xu-752's system because it is “more current, and improved.” *Id.* at 43 (arguing that a POSA “would have been motivated to use a more current, and improved, impedance analyzer, such as, for example, Jones's impedance analyzer.”). Finally, Petitioner asserts that Jones describes “a number of additional advantages of its device that would have motivated a POSA to modify Xu-752's system to use Jones's impedance analyzer, including ‘allowing internal correction of impedance measurement drift, maximized measurement accuracy, and minimized system size.’” *Id.* (citing Ex. 1005 ¶ 3; Ex. 1003 ¶ 121).

Petitioner asserts that the POSA would have had “a reasonable expectation of success in implementing millisecond time resolution between measurements with the modification of Xu-752 to use Jones’s impedance analyzer” because “Jones’s impedance analyzer is capable of millisecond-time resolution between measurements of each well, and a POSA would have been able to use Jones’s ‘massive parallelism’ in design and ‘high temporal sampling’ to provide the claimed millisecond-time resolution.” *Id.* (citing Ex. 1003 ¶ 123; Ex. 1006 ¶ 2). According to Petitioner, “a POSA would have been able to further adapt a combination of Xu-752 and Jones to provide an appropriate number of parallel ADCs and measurement channels, in addition to the eight and twelve parallel ADCs described in Jones’s exemplary embodiments, as desired to further increase speed of sampling time for each well, to monitor multiwell plates with higher numbers of wells, and/or to monitor multiple plates.” *Id.* (citing Ex. 1003 ¶ 123).

*ii. Analysis*

Patent Owner disputes Petitioner’s showing for the “millisecond time resolution” limitation in claims 1–8 and 11–15. Patent Owner argues that even if “a POSA would have been motivated to develop an impedance system capable of millisecond time resolution, a POSA would not look to Jones because Jones does not teach an impedance system capable of millisecond time resolution, or even suggest any solution or reason to increase the ‘target **1.5 second** time period’ of Jones’ disclosed system.” PO Resp. 3. Patent Owner contends that Jones is concerned instead with the physical arrangement of its system, with the goal of improving “internal correction of impedance measurement drift, maximized measurement

accuracy, and minimized system size.” *Id.* at 26 (quoting Ex. 1006, code (57)).

We agree with Patent Owner that Petitioner has not shown that a POSA, seeking to make an impedance system measure cell behavior that requires millisecond time resolution, would look to Jones. As Petitioner points out, there is nothing in Jones that suggests a goal of reducing the time period between two consecutive measurements into the millisecond range. PO Resp. 3 (“Jones does not disclose or suggest improving the speed of making impedance measurements resulting in an ‘increased throughput,’ . . . or improving the speed of making impedance measurements.”). To the contrary, Jones’s only exemplified embodiment discloses a “target 1.5 second update period.” Ex. 1006 ¶ 30 (“calculations to determine sufficient samples suggest a 1091 mS measurement period, leaving 409 mS for multiplexer switching and signal settling within the target 1.5 second update period”); Ex. 2009 ¶¶ 37, 52 (testimony of Dr. Sanchez that Jones has a target update period of 1.5 seconds and does not suggest that its system could operate faster).

At oral argument, Petitioner’s counsel argued that Jones teaches that its system provides “high temporal sampling,” and thus that “speed matters.” Tr. 59:5–60:14. But, the absence of teachings in Jones suggesting to reduce the time between measurements, and the absence of embodiments that measure faster than the “target” update period of 1.5 seconds, suggests that Jones considers a 1.5 second update period to provide “high temporal sampling.” Ex. 1006 ¶¶ 3, 30. Thus, although speed may matter, Jones teaches that a speed of 1.5 seconds is sufficient and does not suggest anything faster.

Moreover, much of the focus of Jones is on attributes other than speed of measurement. For example, Jones teaches that the physical arrangement and electrical configuration of its measurement system “maximizes the accuracy of the impedance measurement by minimizing the electrical path and stray impedances.” Ex. 1006 ¶ 23 (further disclosing that “[t]he minimized path length . . . optimizes phase and gain tracking, and maximizes the immunity to noise”). The physical configuration of Jones’ system also “minimizes the number of needed mechanical supports and eliminates key thermal expansion problems associated with other designs.” *Id.* ¶ 24. This allows “more efficient internal packaging and thermal stabilization of the electronic components (due to reduced convection).” *Id.*; Ex. 2009 ¶ 53 (testimony of Dr. Sanchez that Jones’ objective was to “condense the existing larger format systems into a smaller form factor . . . while maintaining the specification of those systems for such parameters as accuracy, repeatability, and throughput”).

Given that Jones’s only exemplified embodiment targets a 1.5 second update period, that Jones does not suggest reducing the update period, and that much of Jones’s focus is on benefits other than speed of measurement, Jones’s impedance analyzer seems an unlikely choice for a POSA seeking to take measurements having millisecond time resolution. Put another way, we find no persuasive non-hindsight reason that supports Petitioner’s assertion that the POSA would have sought to apply Jones’s impedance analyzer to Xu-752’s system in order to take measurements in millisecond time resolution.

The appearance that Petitioner improperly relied on hindsight in its selection of Jones is furthered by the specific motivation Petitioner proffers.

Petitioner contends that the POSA would have looked to Jones to design a system to measure cell behaviors like electroporabilization, ligand-dependent GPCR activation, and the beating activity of cardiomyocytes. *Id.* at 36–41. Petitioner presents evidence that, in the prior art, cell pore electroporabilization measurements are taken every 10 milliseconds and measurements of changes in cellular morphology as a result of ligand-dependent GPCR activation are taken in as little as 50 ms/well. *Id.* at 36–38 (citing Ex. 1017, 1604 (prior art describing electroporabilization measurements); Ex. 1008, 37 (prior art describing GPCR activation measurements)). Petitioner also asserts that cardiomyocyte beating function occurs on “a very short time scale, in milliseconds,” and reproduces several prior art graphs plotting cardiomyocyte activity consistent with this assertion. *Id.* at 38–40 (citing Ex. 1018, 267 Figure 6; Ex. 1019, 184 Figure 5A; Ex. 1021, 364 Figure 8B). This evidence supports a motivation to pursue a time resolution on the order of tens of milliseconds which is even faster than the claimed “millisecond time resolution” as the parties have agreed this term should be construed. *See* Section III.C., *supra* (i.e., describing the parties’ agreement that it is not necessary to determine whether the time interval between two consecutive impedance measurements is less than 300 milliseconds or less than 500 milliseconds). It is also even further removed from Jones’s target 1.5 second update period, which begs the question—why would a POSA seek to use Jones for this purpose? Petitioner does not sufficiently address that question. Indeed, we find no persuasive non-hindsight reason that supports Petitioner’s assertion that the POSA would have sought to apply Jones’s impedance analyzer to

Xu-752's system in order to take measurements for applications time resolutions on the order of tens of milliseconds.

In addition, the appearance that Petitioner relies on hindsight in turning to Jones is still further supported by Petitioner's reliance on time resolutions that meet the parties' agreed claim construction of "millisecond time resolution," but that are significantly slower than the time resolution goals that Petitioner contends would have motivated the POSA to turn to Jones. For example, in connection with its showing for claim 1, Petitioner points to Dr. Kim's example of a 16-well plate with an 8 x 2 configuration and 3 reference channels, which Dr. Kim calculates would result in a time resolution of 470 milliseconds. Pet. 53. And at oral argument Petitioner asserted that the POSA could achieve the claimed "millisecond time resolution" by reducing the number of frequencies at which measurements are taken from multiple frequencies to one frequency while keeping everything else in Jones's embodiment the same. Tr. 55:6–56:21; *see also*, Ex. 1003 ¶ 72 (testimony of Dr. Kim that using a single frequency would result in a measuring time of 412, 415, and 433 milliseconds, depending on the frequency used)). From a mathematical standpoint, Petitioner may be correct that such configurations would result in a time resolutions of 412, 415, 433, and 470 milliseconds. *See*, Ex. 1003 ¶ 137 (Dr. Kim's testimony explaining calculation). But Petitioner does not explain why a POSA seeking to measure the beating activity of cardiomyocytes, electroporabilization, or ligand-dependent GPCR activation—applications which Petitioner contends employ measurements of 50 milliseconds or less (Pet. 36–41)—would have been motivated to configure Jones for a time resolution above 400 milliseconds. Absent persuasive evidence of any

application that would benefit from measurements having such a time resolution, Petitioner's reliance on these configurations with a suggests an improper reliance on hindsight.<sup>10</sup>

Accordingly, we find that the preponderance of the evidence does not support Petitioner's position that the POSA seeking to modify Xu-752's system so that it could be used in applications requiring millisecond time resolution would have looked to Jones's impedance analyzer.

Even if the POSA would have looked to Jones when seeking to modify Xu-752's system for use in applications requiring millisecond time resolution, Petitioner does not sufficiently support its position that Jones discloses or renders obvious "millisecond time resolution."

As disclosed above, Jones's single exemplary embodiment "targets" a time resolution of 1.5 seconds. As also discussed above, to support that Jones discloses "millisecond time resolution," Petitioner relies on a series of calculations by its expert that use Jones' 96-well embodiment as a baseline to calculate what the time between measurements would be in microtiter

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<sup>10</sup> Petitioner and Dr. Kim describe cardiomyocyte beating function as occurring "on a very short time scale, in milliseconds." Ex. 1003 ¶ 114; Pet. 40. The '508 patent teaches that the beating cycle of cardiomyocytes "may vary depending on organism and developmental stage" and may be "as short as between 100 and 200 milliseconds" or "as long as between 1000 milliseconds and 10,000 milliseconds." Ex. 1001, 10:41–49. It is not clear to what extent the teaching of the '508 patent regarding cardiomyocyte beating times reflects the knowledge in the prior art at the time of the invention. Regardless, Petitioner does not rely on these times as providing motivation. Accordingly, there remains a mismatch between certain of the configurations Petitioner contends meet the claimed millisecond time resolution limitation and Petitioner's purported motivation that suggests hindsight.

plates that use, for example: fewer wells, fewer reference columns, more daughter boards, and a single rather than multiple measurement frequencies. Pet. 53 (citing Pet. § IV.B.1–2; *see* Ex. 1003 ¶¶ 69–75, 137–140). We see several problems with Petitioner’s calculations.

As an initial matter, although Jones discloses that its system may have varying quantities of wells, reference columns, daughter boards, and measurement frequencies (Ex. 1006 ¶¶ 3, 25, 42), it does not disclose an embodiment having a specific configuration of wells, reference columns, daughter boards, and measurement frequencies that results in the claimed millisecond time resolution. Put another way, Jones’s disclosure that its system may have “a single well or [a] multiwell microtiter plate” (*id.* ¶ 3), measure “single or multiple frequencies” (*id.*), arrange daughter boards by column or by row (*id.* ¶ 25), and include embodiments with three and four reference channels (*id.* ¶ 42), is not a disclosure of a specific embodiment having e.g., 16 wells arranged in an 8 x 2 configuration, a single measurement frequency of 10 KHz, 3 reference channels, and 5 daughter boards, with each daughter board measuring 2 wells and 3 reference channels. *See* Ex. 1003 ¶ 139 (testimony of Dr. Kim describing this configuration).

To arrive at a configuration that produces millisecond time resolution, Petitioner must select values for the number of wells, number of daughter boards, number of frequencies measured, and the number of reference channels to be used in its expert’s calculation. *See* Ex. 1003 ¶¶ 69–75, 137–141). Petitioner, however, provides no explanation for *why* the POSA would have selected any particular values for any parameter, relying only on the general motivation to go faster to accommodate applications that require

millisecond time resolution. This is insufficient. *See ParkerVision, Inc. v. Qualcomm Inc.*, 903 F.3d 1354, 1363 (Fed. Cir. 2018) (upholding Board finding that Petitioner had not proven claim unpatentable where prior art produced claimed feature only under certain conditions and where Petitioner “failed to put forth any argument or evidence in its petitions as to whether Nozawa’s device, even if capable of doing so, actually would output a periodic signal [having the claimed feature], or why a person of ordinary skill in the art would have been motivated to use the particular inputs that would result in such an output”); *In re Stepan Co.*, 868 F.3d 1342, 1346 n.1 (Fed. Cir. 2017) (“Whether a rejection is based on combining disclosures from multiple references, combining multiple embodiments from a single reference, or selecting from large lists of elements in a single reference, there must be a motivation to make the combination and a reasonable expectation that such a combination would be successful, otherwise a skilled artisan would not arrive at the claimed combination.”).<sup>11</sup>

Rather than present reasons why the POSA would have modified Jones’s single disclosed example, or selected particular values for Jones’s parameters, Petitioner presents mathematical calculations of what the time resolution would be *if* the POSA decided to modify a particular parameter. *See e.g.*, Ex. 1003 ¶¶ 71–74, 136–141. Petitioner, thus, presupposes that the POSA would have sought to reduce the time between measurements by changing (or selecting a particular number of) wells, daughter boards,

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<sup>11</sup> In our Institution Decision, we expressed concern that “Petitioner and Dr. Kim’s reasoning for those changes [to the parameters disclosed in Jones] is not explained sufficiently in the Petition.” DI 24–25. For the reasons discussed herein, Petitioner’s Reply does not persuasively address these concerns.

reference columns, and/or frequencies used to take measurements. Petitioner then calculates what the time resolution would be if such changes were made.

Petitioner does not identify any prior art teaching to support that it was known to modify these parameters as a way to speed up the time between measurements. *Id.*; Tr. 16:21–17:7 (“[Board]: . . . [A]re there references, for example, that suggest if you need to measure more frequently, you should reduce the number of frequencies or you should reduce the number of wells? [Petitioner’s Counsel] I believe we are relying on our expert for showing that a POSA would have understood these basic levers that you can configure and change, and really are using our expert to show how those different changes would affect the measurement resolution in Jones, starting from that 1.5 second measurement resolution in paragraph 30”); Tr. 20:1–20:8 (“[Board]: So Counsel, just to be clear, Jones does not actually come out and say that if you need to go faster, you can use less frequencies or you can use less wells. That’s something that’s coming just from your expert, correct? [Petitioner’s counsel]: That’s correct. A POSA knows that if you use fewer frequencies, if you don’t measure multiple frequencies, it’s going to be faster. You know, if you measure 16 -- you can measure 16 wells faster than 96 wells.”).

As part of his testimony regarding dependent claims 11–14, Dr. Kim asserts that it “would have been an obvious design choice to configure the Xu-752/Jones system to operate at the millisecond time resolutions.” Ex. 1003 ¶ 178. According to Dr. Kim, the POSA would have known to modify these parameters:

A POSA would have also understood how to configure the Xu-752/Jones system to achieve the millisecond time resolutions recited in claims 9-14, *i.e.*, by choosing system parameters in a manner suitable for achieving the desired time resolution. A POSA would have known, for example, that using a higher number of measurement cycles would increase the amount of time between measurements, while increasing the measurement frequency would decrease the time between measurements. A POSA would have understood how to choose suitable parameters for achieving the claimed resolutions (*e.g.*, number of wells, measurement frequency, and number of cycles per measurement frequency).

Ex. 1003 ¶ 179. But Dr. Kim does not cite to any additional supporting evidence or provide any technical reasoning to support his statements. The notion that one can reduce the time between measurements by, *e.g.*, reducing the number of frequencies measured, has intuitive appeal and appears mathematically correct. However, the absence of technical reasoning and supporting evidence diminishes the persuasiveness of Dr. Kim's testimony that the POSA would make such modifications to reduce the time between measurements.

Dr. Kim does provide some technical reasoning in connection with his discussion of eliminating all reference channels as a way to get the time resolution down to the levels required by, *e.g.*, claim 14, which recites a millisecond time resolution of "less than 5 milliseconds." *See e.g.*, Ex. 1003 ¶ 172 ("A POSA seeking to study biological cell phenomena occurring on the order of a few milliseconds would have recognized that after measuring the reference network channels at the start, the reference network channels would not need measured again for some time, *e.g.*, because temperature and other drift factors do not change appreciably on a millisecond time scale."). However, even if we were to credit this testimony, Dr. Kim still lacks

support and reasoning for the selection of the other parameters in his no-reference-channel calculations. *See, e.g., id.* ¶ 173 (positing, but not providing technical reasoning for using, a no-reference-channel impedance system with 16 wells, a single 10kHz measurement frequency, and 16 daughter boards that measure simultaneously rather than sequentially).

Finally, we note that Dr. Kim provides calculations for only two configurations that result in a time resolution fast enough for the types of applications that Petitioner contends would have motivated the POSA<sup>12</sup>—a configuration resulting in a time resolution of 1.5 milliseconds, and a configuration resulting in a time resolution of 55 milliseconds.<sup>13</sup> *Id.* ¶¶ 171–174. Both of these calculations depart significantly from the single exemplary embodiment disclosed in Jones.

For example, Jones’s embodiment discloses an impedance system having 96 wells in an 8 x 12 configuration with 4 reference channels. Ex. 1006 ¶ 30; Ex. 2004 ¶¶ 35 (testimony of Dr. Sanchez describing Jones’s embodiment); Ex. 1003 ¶ 70 (testimony of Dr. Kim discussing Jones’s

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<sup>12</sup> As discussed above, several of the configurations Dr. Kim calculates (including the two calculations Petitioner identifies in connection with its showing for claim 1) appear too slow for the applications Petitioner contends would have motivated the POSA. *See infra* p. 22–23.

<sup>13</sup> The evidence Petitioner relies upon to support the motivation to pursue millisecond time resolution suggests that a time resolution of 55 milliseconds would be too slow to measure electrophoration or the beating activity of cardiomyocytes, but it may be sufficient to measure changes in cell morphology as a result of ligand-dependent GPCR activation. Ex. 1008, 37 (“Because the readout *can be sampled in as little as 50 ms/well*, the rate of change, magnitude, and duration of the response [to GPCR activation] can be precisely measured”). For purposes of this decision, we assume that 55 milliseconds would be sufficiently fast for this application.

embodiment). Jones's embodiment has 16 daughter boards (8 wells for each daughter board) that take sequential measurements at multiple frequencies. *Id.* This embodiment requires 1091 ms for measurements (16 daughter boards x 68.2 ms per/well) and 409 ms for "multiplexer switching and signal setline." Ex. 1006 ¶ 30. Petitioner's proposed 1.5 milliseconds configuration posits an impedance system with no reference channels, 16 wells, and 16 daughter boards (one daughter board for each well) that take simultaneous measurements at a single measurement frequency of 10 kHz. *Id.* ¶ 173. It requires 1.5 milliseconds for measurement and no time for "multiplexer switching and signal setline." *Id.* Thus, Petitioner's example, changes the number of wells, the number of daughter boards, the number of daughter boards per well, the number of reference channels, the number of frequencies measured, and whether the daughterboards measure sequentially or simultaneously as compared to Jones's embodiment.<sup>14</sup>

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<sup>14</sup> Dr. Sanchez testifies that Jones does not teach simultaneous measurement. Ex. 2009 ¶¶ 39 ("Jones nowhere mentions or suggests . . . calculating impedance values of two or more wells in parallel, or an impedance analyzer that measure the impedances of multiple wells simultaneously or nearly simultaneously."), 58 (testifying that Jones uses "'parallel' and 'perpendicular' to recite the physical arrangement of the components in the system" and that "Jones doesn't discuss any ability to have an impedance analyzer measure the impedances of multiple wells simultaneously or nearly simultaneously"). Dr. Kim testifies that "Jones's parallelism enables all 16 wells to be measured simultaneously." Ex. 1003 ¶ 173. We need not determine whether this testimony can be harmonized because Petitioner's showing is insufficient regardless of whether Jones enables simultaneous measurement. That is, even if Jones enables simultaneous measurement, Petitioner does not provide sufficient persuasive evidence to support that the POSA would have selected simultaneous measurement, let alone all of the other parameters required to achieve the recited "millisecond time resolution."

The degree to which Petitioner’s example departs from the exemplary embodiment disclosed in Jones emphasizes the need for Petitioner to explain and support the values it chose for Jones’s parameters. The absence of a persuasive explanation suggests that the values were selected not because they would have been obvious to a POSA, but because they resulted in a time that met the challenged claims. Accordingly, even if the POSA would have looked to Jones when seeking to modify Xu-752’s system for use in applications requiring millisecond time resolution, the preponderance of the evidence does not support Petitioner’s position that Jones discloses or renders obvious “millisecond time resolution.”

*iii. Conclusion*

For the reasons discussed above, we find that the Petitioner has not carried its burden to demonstrate, by a preponderance of the evidence, that the challenged claims would have been obvious over the combination of Xu-752 and Jones because the POSA would not have looked to Jones when seeking to modify Xu-752’s system for use in applications requiring millisecond time resolution and because, even if the POSA would have turned to Jones, the evidence of record does not support Petitioner’s position that Jones discloses or renders obvious “millisecond time resolution.”

IV. MOTION TO STRIKE

Petitioner moved to strike Exhibits 2024–2037, a series of exhibits that were filed with Patent Owner’s Sur-reply. Mot. 1. Our rules prohibit a patent owner from submitting new evidence with its sur-reply other than deposition transcripts of the cross-examination of any reply witness.

37 C.F.R. § 42.23(b) (“A sur-reply may only respond to arguments raised in

the corresponding reply and may not be accompanied by new evidence other than deposition transcripts of the cross-examination of any reply witness.”). Patent Owner acknowledges our rules, but argues that they are “not absolute” and that we have the authority to waive or suspend them “where good cause exists and doing so would be in the interests of justice.” Mot. Opp. 2.

The reasons provided by Patent Owner for waiving our rules do not convince us that good cause exists or that waiving our rules would be in the interests of justice. We do not interpret Petitioner’s statement that the ’508 patent is “a minor variation on Ghosh, and would have been obvious for all of the reasons stated in the Petition” (Reply 12) as advancing a new ground of unpatentability. Rather, we understand Petitioner to argue, consistent with its argument in the Petition (Pet. 36) that Ghosh provides motivation to achieve millisecond time resolution. Accordingly, we do not agree with Patent Owner that we should waive our rules to allow Patent Owner to rebut a new ground of unpatentability. Mot. Opp. 3.

Patent Owner argues that Petitioner omitted Jones’s switching and settling time in its Reply and that this justifies the submission of new evidence. Mot. Opp. 3–4. We do not agree. We do not view Petitioner’s recitation of the 68.2 milliseconds required to take measurements for each well (Reply 19) as changing Petitioner’s or Dr. Kim’s position that the time resolution in Jones’s single embodiment includes 409 milliseconds for switching and settling (Ex. 1003 ¶ 70 (Dr. Kim’s testimony calculating switching and settling time per well); Tr. 58:1–14 (explaining that Jones discloses 409 milliseconds for switching and settling and that Dr. Kim did the math “409 divided by 16 . . . [t]hat would result in a switching and

settling time of 25.6 milliseconds per well” and therefore Dr. Kim “did not treat switching and settling time as negligible” and “didn’t get rid of it”).

Finally, Patent Owner argues that new evidence was required to rebut Petitioner’s argument that the update time for commercially available impedance systems was irrelevant. Mot. Opp. 4–5. We are not persuaded that Petitioner’s mere assertion that evidence is irrelevant provides good cause to untimely allow more evidence.

In sum, Patent Owner does not persuade us that good cause exists to waive our rules or that doing so would be in the interests of justice. The absence of good cause is further supported by the fact that we do not rely on the untimely submitted evidence in reaching our decision. Accordingly, we grant Petitioner’s Motion to Strike Exhibits 2024–2037 as having been filed in violation of our rules. 37 C.F.R. § 42.23(b)

## V. CONCLUSION

In summary, we determine that Petitioner has not established by a preponderance of the evidence that claims 1–8 and 11–15 are unpatentable for the reasons discussed above. This determination is shown in the following table. In addition, we grant Petitioner’s Motion to Strike.

| <b>Claims</b>              | <b>35<br/>U.S.C. §</b> | <b>Reference(s)/Basis</b> | <b>Claims<br/>Shown<br/>Unpatentable</b> | <b>Claims<br/>Not shown<br/>Unpatentable</b> |
|----------------------------|------------------------|---------------------------|------------------------------------------|----------------------------------------------|
| 1–8, 11–15                 | 103                    | Xu-752, Jones             |                                          | 1–8, 11–15                                   |
| <b>Overall<br/>Outcome</b> |                        |                           |                                          | 1–8, 11–15                                   |

VI. ORDER

Accordingly, it is:

ORDERED that Petitioner has not established, by a preponderance of the evidence, that claims 1–8 and 11–15 of the ’508 patent are unpatentable;

ORDERED that Petitioner’s Motion to Strike Exhibits 2024–2037 is granted;

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2024-01467  
Patent 11,906,508 B2

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