

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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10X GENOMICS, INC.,  
Petitioner,

v.

BIO-RAD LABORATORIES, INC.,  
Patent Owner.

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IPR2020-00086  
Patent 9,562,837 B2

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Before CHRISTOPHER M. KAISER, KIMBERLY McGRAW, and  
ELIZABETH M. ROESEL, *Administrative Patent Judges*.

ROESEL, *Administrative Patent Judge*.

DECISION  
Granting Institution of *Inter Partes* Review  
35 U.S.C. § 314

## I. INTRODUCTION

### A. *Background and Summary*

10X Genomics, Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) seeking *inter partes* review of claims 1–4, 7–13, 19, and 20 (the “challenged claims”) of U.S. Patent No. 9,562,837 B2 (“the ’837 Patent”). Bio-Rad Laboratories, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 7 (“Prelim. Resp.”).

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314 (2012); 37 C.F.R. § 42.4(a) (2019). An *inter partes* review may not be instituted “unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (2012). Applying this standard, and upon consideration of the information presented in the Petition and the Preliminary Response, we determine Petitioner has shown a reasonable likelihood that it would prevail with respect to at least one claim challenged in the Petition. Therefore, institution of an *inter partes* review is granted.

Our findings and conclusions below are based on the record developed thus far. This is not a final decision as to the patentability of any challenged claim. Any final decision will be based on the full record developed during trial.

### B. *Real Parties in Interest*

Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioner identifies 10X Genomics, Inc. as the real party in interest. Pet. 71. Patent Owner identifies Bio-Rad Laboratories, Inc. as the real party in interest. Paper 6 (Mandatory Notices).

*C. Related Matters*

Pursuant to 37 C.F.R. § 42.8(b)(2), the parties identify the following district court action: *Bio-Rad Laboratories, Inc. v. 10X Genomics, Inc.*, 1:18-cv-01679-RGA (D. Del.). Pet. 71; Paper 6.

Petitioner filed a second petition challenging the '837 Patent and a Notice of Ranking in which the Petition in IPR2020-00086 (“the 086 Petition”) is ranked first, and the petition in IPR2020-00087 (“the 087 Petition”) is ranked second. Paper 3 at 1.

In addition, Petitioner filed two petitions for *inter partes* review of related U.S. Patent No. 9,896,722 B2, which was issued on a continuation-in-part application of the '837 Patent. *10X Genomics, Inc. v. Bio-Rad Laboratories, Inc.*, IPR2020-00088, Paper 2; *10X Genomics, Inc. v. Bio-Rad Laboratories, Inc.*, IPR2020-00089, Paper 2.

*D. The '837 Patent*

The '837 Patent was issued on an application filed April 2, 2013, and lists a number of provisional and non-provisional priority applications, the earliest of which were filed May 11, 2006. Pet. 3; Ex. 1001, codes (22), (60), (63).

The '837 Patent is titled “Systems for Handling Microfluidic Droplets.” Ex. 1001, code (54). The '837 Patent discloses an assembly that includes a droplet formation module and a chamber. *Id.* at code (57); 3:11–12, 3:36–37, 52:38–39, 53:21–22. The droplet formation module is configured to form droplets surrounded by an immiscible fluid. *Id.* at code (57); 3:12–20, 52:39–48. The chamber is configured to receive droplets and immiscible fluid and has an outlet configured to receive substantially only droplets. *Id.* at code (57), 3:37–48, 53:22–25. According

to the '837 Patent, the assembly is “particularly useful for reducing potential contamination associated with sample handling.” *Id.* at 52:27–29.

Figure 38 of the '837 Patent is reproduced below:

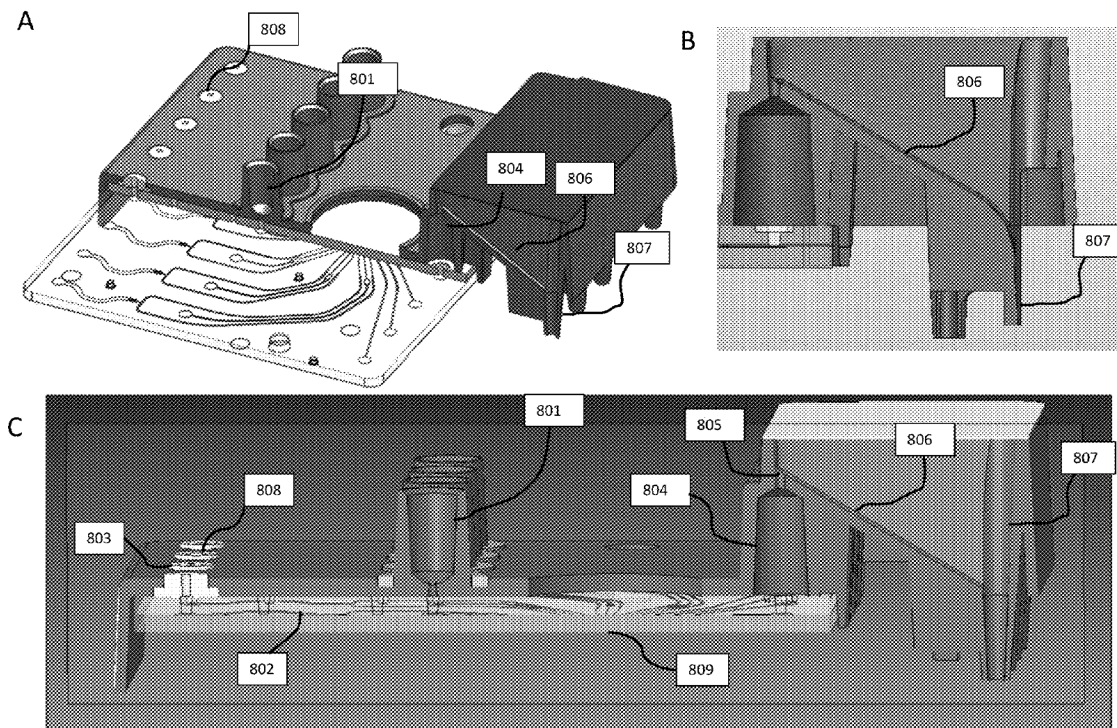


FIG. 38

Figure 38 shows a microfluidic assembly that includes a droplet formation module and a chamber. Ex. 1001, 8:22–23, 53:47–48, 53:62–65, 54:34–41. The droplet formation module includes sample input 801, channel 802, and oil input 803. *Id.* at 53:62–65. The assembly includes chamber 804 equipped with outlet 805, which is connected to slide 806, which is in turn connected to output nozzle or exit port 807. *Id.* at 54:34–41, 54:47–57, 54:61–63. The assembly also includes reagent input 808 and coalescence module 809. *Id.* at 54:4–6, 54:19–22.

An aqueous sample solution is introduced through sample input 801, and oil is introduced through oil input 803. Ex. 1001, 53:48–50, 53:59–60. The oil and aqueous solution meet at a junction in channel 802 such that the

aqueous solution in segmented by the oil, thereby forming droplets. *Id.* at 53:60–62. “As the oil containing the droplets moves along the assembly through the channel 802, the oil and droplets begin to enter the chamber 804.” *Id.* at 54:37–39. “Due to the difference in their respective densities, the oil and droplets separate from each other in the chamber 804.” *Id.* at 54:39–41. Droplets exit chamber 804 into outlet 805 “leaving a large part of the oil behind.” *Id.* at 54:41–44. Droplets exiting chamber 804 through outlet 805 enter slide 806 and travel through the slide and nozzle 807, which leads to a vessel or container for collecting the droplets. *Id.* at 54:51–59.

*E. Illustrative Claims*

The '837 Patent includes 20 claims. Claim 1 is the sole independent claim and is reproduced below, with paragraph breaks adjusted and bracketed numbers added to correspond with Petitioner's identification of claim elements:

1. [1.0] An assembly, the assembly comprising:
  - [1.1] a microchannel in a horizontal plane;
  - [1.2] at least one droplet formation module comprising a sample inlet, an immiscible fluid inlet, and a junction, wherein the junction is located between the sample inlet and the microchannel and the droplet formation module is configured to produce droplets comprising the sample surrounded by the immiscible fluid; and
  - [1.3] at least one downstream separation chamber comprising a droplet receiving chamber inlet and at least one droplet receiving outlet,
  - [1.4] wherein the separation chamber is upright to the microchannel and out of the horizontal plane;

[1.5] wherein the droplet formation module and the separation chamber are in fluid communication with each other via the microchannel;

[1.6] and wherein the separation chamber has a wider cross-section than the microchannel cross-section to accumulate a plurality of droplets comprising the sample and

[1.7] is of a volume sufficient to separate the plurality of droplets comprising the sample from the immiscible fluid within the separation chamber.

Ex. 1001, 88:2–23; *see also* Pet. 31–45 (identifying claim elements).

*F. Asserted Grounds and Evidence*

Petitioner challenges claims 1–4, 7–13, 19, and 20 based on the following grounds of unpatentability:

	<b>Claims Challenged</b>	<b>35 U.S.C. §</b>	<b>Reference(s)</b>
1	1, 2, 4, 10–13, 19, 20	102	Ismagilov 091 <sup>1</sup>
2	1, 2, 4, 7, 9–13, 19, 20	103	Ismagilov 091, Quake <sup>2</sup>
3	1–4, 7–13, 19, 20	103	Ismagilov 119 <sup>3</sup>
4	1–4, 7–13, 19, 20	103	Ismagilov 119, Pamula 634 <sup>4</sup>
5	1–4, 7–13, 19, 20	103	Ismagilov 119, Pamula 238 <sup>5</sup>

Petitioner relies on a Declaration of Richard B. Fair, Ph.D. Ex. 1008.

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<sup>1</sup>Ex. 1004, Ismagilov et al., US 7,129,091 B2, issued Oct. 31, 2006 (“Ismagilov 091”).

<sup>2</sup>Ex. 1006, Quake et al., US 2002/0058332 A1, published May 16, 2002 (“Quake”).

<sup>3</sup>Ex. 1005, Ismagilov et al., US 2006/0094119 A1, published May 4, 2006 (“Ismagilov 119”).

<sup>4</sup>Ex. 1007, Pamula et al., US 2007/0243634 A1, published Oct. 18, 2007 (“Pamula 634”).

<sup>5</sup>Ex. 1018, Pamula et al., US 2015/0148238 A1, published May 28, 2015 (“Pamula 238”).

## II. ANALYSIS

### A. Legal Standards

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)); *see also* 37 C.F.R. § 42.104(b) (requiring a petition for *inter partes* review to identify how the challenged claim is to be construed and where each element of the claim is found in the prior art patents or printed publications relied upon).

A claim is anticipated under 35 U.S.C. § 102 only if “each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987). A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved based on 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) objective evidence of nonobviousness, i.e., secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Additionally, the obviousness inquiry typically requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (*citing In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2016) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)). Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements,” but “must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

*B. Level of Ordinary Skill in the Art*

Petitioner provides the following contention regarding a person of ordinary skill in the art (“POSA”):

A POSA would have (1) a PhD in chemistry, biochemistry, mechanical or electrical engineering, or a related discipline with one year of experience related to systems for handling microfluidic droplets, (2) a Bachelor of Science in such fields with four years of such experience, or (3) a higher level of education but less relevant practical experience, or more practical experience but less education that would be equivalent to these qualifications before the effective filing date (post-AIA) or before the time of invention (pre-AIA) of the claimed invention. The POSA would have knowledge of scientific literature concerning droplets (including emulsions), and systems and methods for handling them (including both their formation and handling downstream of formation), their applications, and chemistry, components, and reactions that occur within them. A POSA may have worked on a multidisciplinary team and drawn on his or her own skills along with certain specialized skills of others; and a chemist, engineer, and biologist may have been part of the team. Before the effective filing date or time of invention, the state of the art included the teachings of the references in this Petition. A POSA



would have been aware of other important references on handling microfluidic droplets.

Pet. 3. At this stage, Petitioner's contention regarding the level of ordinary skill in the art is not contested by Patent Owner. For purposes of this Decision, we accept Petitioner's uncontested contention, which is supported by Dr. Fair's testimony (Ex. 1008 ¶ 47) and is consistent with the scope and content of the '837 Patent and the asserted prior art.

### *C. Claim Construction*

In an *inter partes* review, we apply the same claim construction standard as would be used by a district court to construe a claim in a civil action involving the validity or infringement of a patent. 37 C.F.R. § 42.100(b) (2019). Under that standard, claim terms are given their ordinary and customary meaning, as would have been understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history of record. *Id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–19 (Fed. Cir. 2005) (en banc) (“*Phillips*”); *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365–66 (Fed. Cir. 2012) (unless a claim term has been expressly defined by the patentee or has been limited by a clear and unmistakable disavowal of claim scope, then it should receive its ordinary meaning).

Petitioner bases its challenges either on its own proposed claim constructions or, alternatively, on claim constructions that Petitioner believes Patent Owner will adopt based on Patent Owner's infringement contentions in the related district court action. Pet. 18–20, 24–25; *see* Prelim. Resp. 12 (characterizing Petitioner's constructions). At this stage, Patent Owner does not contest any of Petitioner's claim constructions, nor does Patent Owner propose any express claim constructions of its own. *See*

Prelim. Resp. 8–9. Below we address two claim terms, and we also address Patent Owner’s argument that Petitioner failed to construe the claims in Grounds 1 and 2. We determine that no other claim term requires express construction for purposes of this Decision. *See, e.g., Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

1. “separation chamber”

Claim 1 recites that the claimed assembly comprises “at least one downstream separation chamber.” Ex. 1001, 88:10. Claim 1 further recites that the separation chamber “is of a volume sufficient to separate the plurality of droplets comprising the sample from the immiscible fluid within the separation chamber.” *Id.* at 88:18–23.

Petitioner contends that “separation chamber” should be construed as “a space that is substantially enclosed” and that “one of ordinary skill would not understand the term ‘separation chamber’ to include open containers.” Pet. 19, 21–22. As support for this construction, Petitioner cites dictionaries that define a “chamber” as an “enclosed space or cavity.” *Id.* at 21 (citing Exs. 1027, 1028). Petitioner also cites the purpose of the ’837 Patent’s invention to eliminate the risk of contamination by avoiding operator handling of droplets. *Id.* (citing, e.g., Ex. 1001, 52:33–37). Petitioner acknowledges the Specification’s disclosure that a chamber can “include any vessel suitable for holding droplets, for example, test tubes, vials, beakers, jars, and PCR tubes” (*Id.*, citing Ex. 1001, 53:35–38), but argues that such chambers “are consistently and exclusively *enclosed*—not open—when in

use with a ‘seal’ to ‘minimize potential contamination.’” *Id.* at 21–22 (citing, e.g., Ex. 1001, 55:55–65, Fig. 39).

We determine that Petitioner’s proposed construction that excludes open containers is inconsistent with how the term “chamber” is used in the Specification. The Specification states “[i]t is to be understood that *the chamber can include any vessel suitable for holding droplets*, for example, test tubes, vials, beakers, jars, and PCR tubes.” Ex. 1001, 53:35–38 (emphasis added). As Petitioner’s argument acknowledges, the disclosed examples—test tubes, vials, beakers, jars, and PCR tubes—are all open vessels, unless and until they are closed by a seal or other closure. Pet. 21. Although Petitioner directs us to the description of vessel 903 that is sealably connected to the assembly (*id.* (citing Ex. 1001, 55:55–65, Fig. 39)), the cited portion of the Specification is merely a description of a preferred embodiment that does not limit the scope of the claims. Moreover, the cited description does not limit the meaning of “chamber” to an “enclosed” space because vessel 903, within which oil is separated from droplets due to density differences, refers to the vessel alone, *without* the cap that seals it to the assembly. Ex. 1001, 55:60–62 (“In certain embodiments, the assembly includes a PCR tube cap 904 that lock[s] the vessel 903 into a sealed position.”); *see also id.* at 57:38–41 (stating “vessels for use with the invention *may* be sealed. For example, the lid to a PCR tube . . . *may* be closed to prevent contamination” (emphasis added)).

Interpreting “chamber” as not requiring a space that is substantially closed and not excluding an open container is also consistent with the structure of the claims. Claim 1 recites a “separation chamber comprising . . . at least one droplet receiving outlet.” Ex. 1001, 88:10–12. Claim 7 depends from claim 1 and recites: the droplet receiving outlet is coupled to

a vessel,” and claim 8 depends from claim 7 and recites that “the droplet receiving outlet is sealably coupled to a vessel.” *Id.* at 88:40–43. The subject matter of claim 1 is necessarily broader than the subject matter of dependent claims 7 and 8 and is not limited to a separation chamber that is closed by being sealably coupled to a vessel.

Accordingly, for these reasons, we decline to adopt Petitioner’s proposed construction for “separation chamber.” Instead, for purposes of this Decision, we apply Petitioner’s alternative construction, namely that “separation chamber” is “[b]road enough to encompass an open well.” Pet. 19. This construction is consistent with the Specification’s disclosure that “the chamber can include any vessel suitable for holding droplets, for example, test tubes, vials, beakers, jars, and PCR tubes.” Ex. 1001, 53:35–38. It is also consistent with Patent Owner’s infringement contentions, where Patent Owner identifies a “separation chamber” as corresponding to an outlet well that collects droplets. Ex. 1026, 9–12. We do not conclude that Petitioner’s alternative construction for “separation chamber” is necessarily correct, but at this stage of the proceeding, no better construction has been proposed by the parties.

2. *“droplet receiving outlet”*

Claim 1 recites that the separation chamber comprises “a droplet receiving chamber inlet and at least one droplet receiving outlet.” Ex. 1001, 88:10–12.

Petitioner first contends that “droplet receiving outlet” should be construed as a means-plus-function limitation pursuant to 35 U.S.C. § 112(f). Pet. 18, 20. Petitioner next contends that, if the term is not subject to § 112(f), then a “droplet receiving outlet” should be construed as “a

structure connected to the interior space of the chamber and configured so that substantially only droplets flow into it when exiting the chamber.” *Id.* at 18–19. As support for its constructions, Petitioner argues that “‘droplet receiving outlet’ . . . is not in the specification and has no well-understood meaning in the art.” Pet. 20 (citing Ex. 1008 ¶ 80). In addition, Petitioner argues that the term is “described in functional terms” both in the claims and the specification. *Id.* (citing Ex. 1001, code (57), 3:46–58, 53:21–35).

We first address Petitioner’s contention that a “droplet receiving outlet” should be construed as a means-plus-function limitation. Under applicable law, if a claim term lacks the word, “means,” there is a rebuttable presumption that the term is not subject to 35 U.S.C. § 112(f).<sup>6</sup> *MTD Prod. Inc. v. Iancu*, 933 F.3d 1336, 1341 (Fed. Cir. 2019); *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (en banc). A challenger can rebut the presumption by demonstrating that “the claim term fails to recite sufficiently definite structure or else recites function without reciting sufficient structure for performing that function.” *Williamson*, 792 F.3d at 1348 (internal quotes, brackets, and citation omitted). “One way to demonstrate that a claim limitation fails to recite sufficiently definite structure is to show that, although not employing the word ‘means,’ the claim limitation uses a similar nonce word that can operate as a substitute for ‘means’ in the context of § 112, para. 6.” *MTD*, 933 F.3d at 1341 (internal quotes omitted); *Williamson*, 792 F.3d at 1350.

Here, the disputed claim term is “droplet receiving outlet.” Because the claim term does not recite the word “means,” there is a rebuttable

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<sup>6</sup> Although the cited case law addresses the pre-AIA version of the statute (35 U.S.C. § 112, ¶ 6), the same principles apply to the post-AIA version (35 U.S.C. § 112(f)).

presumption that it is not a means-plus-function term. We find that Petitioner has not rebutted the presumption. Petitioner's arguments and evidence do not persuade us that "droplet receiving outlet" fails to recite sufficiently definite structure. Petitioner does not argue that "outlet" is a "nonce word that can operate as a substitute for 'means'" in the context of a patent claim. *Williams*, 792 F.3d at 1350. In our view, "outlet" is not a generic term, like "module," "mechanism," "element," or "device," that is commonly used as a verbal construct to claim a particular function rather than to describe a sufficiently definite structure. *Cf. MTD*, 933 F.3d at 1341. Although Dr. Fair opines that a POSA "would consider the term 'droplet receiving outlet' not to be a term used by persons of skill in the art to designate either a particular structure or a class of structures," he cites no evidence to support that opinion. Ex. 1008 ¶ 80. We find that Dr. Fair's opinion is undermined by his concession that a POSA "is familiar with numerous outlet structures." *Id.* In our view, "outlet" is not a nonce word, and the term "droplet receiving outlet" conveys sufficiently definite structure and is not subject to 35 U.S.C. § 112(f) or § 112, ¶ 6.

We also reject Petitioner's argument that "droplet receiving outlet" should be construed as requiring that "substantially only droplets" exit the chamber through the outlet. Pet. 18–21. Petitioner directs us to several Specification passages that describe a chamber outlet in this manner. *Id.* at 20 (quoting Ex. 1001, code (57), 3:46–48, 53:24–25, 53:32–35, and citing 53:21–41, 54:34–46, 55:41–44). Petitioner provides no justification, however, for reading these descriptions from the Specification into the claim. *Thorner*, 669 F.3d at 1365–66 (absent an express definition or clear and unmistakable disavowal, claim terms should receive their ordinary meaning). Moreover, the Specification describes outlet 805, which is shown

in Figure 38, as positioned where the rising droplets will exit chamber 804 into outlet 805 and “leaving a large part of the oil behind.”

Ex. 1001, 54:41–44. Because the Specification states that a “large part of the oil” is left behind, as opposed to “substantially all of the oil” is left behind, it can be presumed that at least part of the oil exits chamber 804 into outlet 805 with the droplets. *Id.*

Furthermore, Petitioner’s proposed construction requiring that “substantially only droplets” exit the chamber through the outlet is inconsistent with dependent claim 10, which depends from claim 1 and recites: “wherein the droplet receiving outlet receives substantially one or more droplets.” Ex. 1001, 88:46–47. Dependent claim 10 describes the function of the “droplet receiving outlet” in a manner similar to Petitioner’s proposed construction, except that the word “only” is conspicuously missing from claim 10. As a matter of law, we cannot construe independent claim 1 more narrowly than dependent claim 10. 35 U.S.C. § 112(d) (corresponding to pre-AIA § 112, ¶ 4); *Trustees of Columbia Univ. in City of New York v. Symantec Corp.*, 811 F.3d 1359, 1370 (Fed. Cir. 2016) (“[W]here dependent claims have no meaningful difference other than an added limitation, . . . construing the independent claim to exclude material covered by the dependent claim would be inconsistent.”).

Accordingly, for these reasons, we decline to adopt Petitioner’s proposed constructions for “droplet receiving outlet.” Pet. 18–21. Instead, for purposes of this Decision, we apply Petitioner’s alternative construction, namely that “droplet receiving outlet” is “[b]road enough to include the opening at the top of an open outlet well.” *Id.* at 18.

As discussed above, the Specification discloses that “the chamber can include any vessel suitable for holding droplets, for example, test tubes,

vials, beakers, jars, and PCR tubes.” Ex. 1001, 53:35–38. Each of these examples is an open vessel, with an opening at the top, and the Specification does not exclude the possibility, consistent with Petitioner’s alternative construction, that a “droplet receiving outlet” could be the opening at the top of an open vessel. The Specification describes several examples of a droplet receiving outlet and does not limit the scope of the term to the disclosed embodiments. *Id.* at 62:11–23. The Specification states that “the outlet 805 can be positioned at an upper portion of the chamber 804 where the rising droplet will exit the chamber 804 into the outlet 805.” *Id.* at 54:41–44; *see also id.* at 59:55–63 (in Figure 38, outlet 805 is positioned at the top of chamber 804 to collect droplets that are displaced by oil flowing into the chamber and that rise to the top of the chamber). The Specification further states outlet 805 is not limited to what is depicted in the figures and may have various configurations. *See, e.g., id.* at 54:34–55:21. For example, the Specification describes that, in one embodiment, outlet 805 may be in fluid communication with slide 806 such that droplets exiting chamber 804 through outlet 805 will enter slide 806. *Id.* at 54:51–53. In other embodiments, outlet 805 may be sealably coupled to a vessel so as to prevent contamination as the droplets are transferred to the vessel. *Id.* at 55:1–4. In yet other embodiments, the assembly may include a device that surrounds both the outlet and the rim of the vessel to prevent fluid loss when the droplets enter the vessel. *Id.* at 55:8–11.

Petitioner’s alternative construction is consistent with Patent Owner’s infringement contentions, where Patent Owner identifies a “droplet receiving outlet” as corresponding to the location where a pipette is inserted to remove droplets from an outlet well. Ex. 1026, 11–12. We do not conclude that Petitioner’s alternative construction for “droplet receiving outlet” is



necessarily correct, but at this stage of the proceeding, no better construction has been proposed by the parties.

We note that our claim constructions at this stage in the proceeding are preliminary. Our ultimate interpretation of the claims will be based on the complete record at the end of trial.

### 3. *Alleged Failure to Construe the Claims*

Patent Owner argues that the Board should deny institution of the Petition because Petitioner failed to construe the claims in Grounds 1 and 2. Prelim. Resp. 11–18. Patent Owner argues that Petitioner’s Grounds 1 and 2 are based on claim constructions Petitioner believes Patent Owner will assert based on its infringement contentions and Complaint in the related district court action. *Id.* at 12. According to Patent Owner, “Petitioner makes clear that it believes these constructions are incorrect.” *Id.* Patent Owner argues that Petitioner does not satisfy the requirements of 37 C.F.R. § 42.104(b)(3)–(4) and the *Consolidated Trial Practice Guide* (November 2019)<sup>7</sup> “by proffering constructions with which it expressly disagrees in a proceeding applying the *Phillips* claim construction standard.” Prelim. Resp. 12.<sup>8</sup>

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<sup>7</sup> Available at <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf?MURL=>; hereinafter as “CTPG.”

<sup>8</sup> Patent Owner relies on a several prior Board decisions. Prelim. Resp. 13 (citing *OrthoPediatrics Corp. v. K2M, Inc.*, IPR2018-01548, Paper 9 (PTAB Mar. 1, 2019) (denying institution of *inter partes* review); *Intel Corp. v. Qualcomm Inc.*, IPR2018-01326, Paper 8 (PTAB Jan. 15, 2019) (instituting *inter partes* review); *Hologic, Inc. v. Enzo Life Sciences, Inc.*, IPR2018-00019, Paper 21 (PTAB Nov. 28, 2018) (denying request for rehearing of denial of institution); *Western Digital Corp. v. SPEX Techs., Inc.*, IPR2018-00084, Paper 14 (PTAB Apr. 25, 2018) (instituting *inter partes* review);

Under the circumstances of this case, we disagree with Patent Owner's assertion that the applicable rules and guidance prohibit Petitioner from relying on a claim construction that it believes is incorrect, namely a claim construction relied upon by Patent Owner to assert infringement in the related district court action. In pertinent part, Rule 42.104(b) requires that a petition set forth: "(3) How the challenged claim is to be construed. . . . [and] (4) How the construed claim is unpatentable." 37 C.F.R.

§ 104(b)(3), (4). Under the circumstances of this case, the rule does not prohibit Petitioner from submitting a claim construction it believes is incorrect and relying on that construction to show how the claim is unpatentable.

Our interpretation of 37 C.F.R. § 42.104(b) is consistent with its regulatory history, which indicates that the rule aims to increase efficiency and provide notice to the patentee. *Changes to Implement Inter Partes Review Proceedings, Post-Grant Review Proceedings, and Transitional Program for Covered Business Method Patents*, 77 Fed. Reg. 48,680, 48,688 (August 14, 2012) (Rule 104(b) "provides an efficient means for identifying the legal and factual basis for satisfying the threshold for instituting *inter*

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*CareFusion Corp. v. Baxter Int'l, Inc.*, IPR2016-01456, Paper 9 (PTAB Feb. 6, 2017) (denying institution of *inter partes* review)). None of these decisions has been designated precedential or informative, and none is binding on this panel. Nevertheless, as discussed below, our reasoning is consistent with the reasoning in *Western Digital. OrthoPediatrics* is distinguishable because there the petition failed to identify how the challenged claims were to be construed and applied to the prior art, and the petitioner took conflicting positions between the IPR proceeding and the related district court litigation. *CareFusion* is distinguishable because there the petitioner's erroneous claim constructions infected all of petitioner's patentability challenges.

*partes* review and provides the patent owner with notice as to the basis for the challenge to the claims.”). Responding to comments criticizing the claim construction requirement of Rule 104(b), the Office stated: “the petitioner’s claim construction will help to provide sufficient notice to the patent owner on the proposed grounds of unpatentability, and assist the Board in analyzing to how a cited prior art reference meets the claim limitation(s).” *Id.* at 48,699 (Response to Comment 35). Here, judicial efficiency will be enhanced by allowing Petitioner to rely upon a claim construction that Patent Owner is relying upon in the related district court litigation to assert infringement of the challenged patent.

Under the circumstances of this case, the *Consolidated Trial Practice Guide* likewise does not prohibit Petitioner from submitting and relying on a claim construction that it believes is incorrect. Patent Owner relies on the statement, “If a petitioner believes that a claim term requires an express construction, the petitioner must include a statement identifying a proposed construction of the particular term and where the intrinsic and/or extrinsic evidence supports that meaning.” Prelim. Resp. 12 (quoting CTPG, 44). Patent Owner also relies on the statement, “On the other hand, a petitioner may include a statement that the claim terms require no express construction.” *Id.* (quoting CTPG, 44). Neither statement prohibits Petitioner from relying on a claim construction that it believes is incorrect, namely the claim construction Petitioner understands Patent Owner to rely upon to assert infringement in the related district court action.

Patent Owner’s contrary argument is inconsistent with 35 U.S.C. § 301(a)(2), which is cited by Petitioner. Pet. 18. That statute provides:

Any person at any time may cite to the Office in writing—  
...

(2) statements of the patent owner filed in a proceeding before a Federal court or the Office in which the patent owner took a position on the scope of any claim of a particular patent.

35 U.S.C. § 301(a)(2). The statute expressly permits petitioner to cite “at any time” a patent owner’s statements filed in a Federal court in which patent owner took a position on the scope of a patent claim. There is no requirement that a petitioner agree with the patent owner’s statement as a prerequisite for submitting it to the Office and relying on it as a basis for challenging patentability. Under the circumstances of this case, we see no problem with Petitioner relying on statements by Patent Owner in the related district court action in which Patent Owner took a position on the scope of a challenged claim of the ’837 patent.

Contrary to Patent Owner’s argument, our interpretation of 37 C.F.R. § 42.104(b) is not affected by the recent rule change adopting the same claim construction standard for AIA proceedings as is applicable in a district court infringement action. *See Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board*, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (Final Rule). Patent Owner argues that allowing a petitioner to rely on a claim construction without expressing agreement with the construction applies only under the “broadest reasonable interpretation” standard, “which is not the case here.” Prelim. Resp. 15–16. We disagree. Nothing in the revised rule or the accompanying commentary supports a change in the requirements for satisfying 37 C.F.R. § 42.104(b)(3), (4). The regulatory history indicates that “aligning the claim construction standard used in AIA proceedings with the standard used in the federal courts and ITC proceedings” will reduce opportunities for “parties to take inconsistent positions between PTAB

proceedings for patentability and litigation for infringement.” 83 Fed. Reg. at 51,350. This comment is consistent with allowing petitioners to rely on positions taken by a patent owner regarding claim scope in related infringement litigation.

Our view is also supported by the *Consolidated Trial Practice Guide*, which addresses both the requirement to address claim construction in the petition (CTPG, 44–45) and the revised claim construction standard (*id.* at 45–46), with no indication that adoption of a revised claim construction standard changed the way that claim construction should be addressed in the petition under 37 C.F.R. § 104(b)(3), (4).

Finally, our interpretation of 37 C.F.R. § 104(b)(3) is consistent with the panel’s decision in *Western Digital Corp. v. SPEX Techs., Inc.*, IPR2018-00084, Paper 14 (PTAB Apr. 25, 2018), which is cited by Patent Owner. Prelim. Resp. 13. There, the panel wrote:

We agree with Petitioner that 37 C.F.R. § 104(b)(3) does not require Petitioner to express its subjective agreement regarding correctness of its proffered claim constructions or to take ownership of those constructions. Petitioner complies with our rules by identifying claim constructions it proposes as the basis for requesting review of the challenged claims. Petitioner’s statement that its Petition “is *based on* the claim constructions urged by Patent Owner” in related District Court litigation . . . suffices to identify claim constructions Petitioner is adopting for purposes of the requested review in compliance with § 104(b)(3).

*Western Digital*, Paper 14 at 12 (record citation omitted). Here, as in *Western Digital*, Petitioner bases Grounds 1 and 2 on claim constructions implied by Patent Owner’s district court infringement contentions without expressing subjective agreement with those constructions. Pet. 23–25. Because the Petition expressly sets forth Patent Owner’s expected claim interpretations as Petitioner’s proposed alternative constructions for

purposes of Grounds 1 and 2 of the requested *inter partes* review (*id.* at 18–20), we hold that the Petition complies with 37 C.F.R. § 42.104(b)(3).

Second, even if our rules and guidance were correctly interpreted as prohibiting a petitioner from relying solely on a claim construction it believes is incorrect, that is not what Petitioner has done here. Petitioner proposes alternative claim constructions and presents at least one ground of unpatentability for each construction. Pet. 18–20, 24–25. The regulatory history accompanying 37 C.F.R. § 42.104(b)(3) expressly contemplates that a petitioner may rely on alternative claim constructions. 77 Fed. Reg. at 48,700 (“The rules do not preclude providing alternative claim constructions in a petition or in later-authorized filings.”).

At least two of the panel decisions cited by Patent Owner also recognize that a petitioner may offer alternative claim constructions. *Intel*, Paper 8 at 11 (“If a petitioner is concerned that the Board may not adopt what it believes to be the proper claim construction, the petitioner may offer alternative constructions and demonstrate unpatentability under each construction.”); *Hologic*, Paper 21 at 6 (“Where a petitioner is concerned that the Board may not adopt what it believes is the proper claim construction, it may choose to offer alternative constructions and demonstrate unpatentability under each construction.”).

For all of the foregoing reasons, we do not deny institution based on Patent Owner’s argument that Petitioner failed to construe the claims in Grounds 1 and 2.

#### *D. Overview of the Asserted References*

We summarize the relevant disclosures of Petitioner’s asserted references below.

1. *Ismagilov 091 (Ex. 1004)*

Ismagilov 091 is asserted as prior art to the '837 Patent under 35 U.S.C. § 102(a)(2) and pre-AIA § 102(e) as of its May 9, 2003 filing date and under § 102(a)(1) and pre-AIA § 102(a) as of its December 8, 2005 publication date. Pet. 12–13. Petitioner contends that Ismagilov 091 is prior art under pre-AIA § 102(b), if the challenged claims are not entitled to their earliest asserted priority date. *Id.* at 13. At this stage, Patent Owner does not contest the prior art status of Ismagilov 091.

Ismagilov 091 discloses microfabricated substrates and methods of conducting reactions in droplets (“plugs”) in a flow of carrier fluid in a substrate. Ex. 1004, code(57).

Ismagilov 091 discloses that “[p]lugs’ . . . are formed in a substrate when a stream of at least one plug-fluid is introduced into the flow of a carrier-fluid in which it is substantially immiscible.” Ex. 1004, 9:20–23. According to Ismagilov 091, the “plugs” may be in the form of “an aqueous plug-fluid . . . surrounded by a non-polar or hydrophobic fluid such as an oil.” *Id.* at 9:39–44. Ismagilov 091 discloses that an “inlet port” is “an area of a substrate that receives plug-fluids,” and “[t]he inlet port can be in fluid communication with a channel.” *Id.* at 8:41–42, 8:46–47. According to Ismagilov 091, a “channel” includes “microchannels.” *Id.* at 7:46–48. Ismagilov 091 discloses that an “outlet port” is “an area of a substrate that collects or dispenses the plug-fluid, carrier-fluid, plugs or reaction product.” *Id.* at 9:5–8.

In a section headed, “Channels and Devices,” Ismagilov 091 discloses a device that “includes one or more substrates comprising a first channel comprising an inlet separated from an outlet.” Ex. 1004, 14:20–23. According to Ismagilov 091,

The device may have one or more outlet ports or inlet ports. Each of the outlet and inlet ports may also communicate with a well or reservoir. The inlet and outlet ports may be in fluid communication with the channels or reservoirs that they are connecting or may contain one or more valves.

*Id.* at 14:36–40. In this section, Ismagilov 091 also discloses that “a plug-forming region generally comprises a junction between a plug-fluid inlet and a channel containing the carrier-fluid such that plugs form.” *Id.* at 14:44–45.

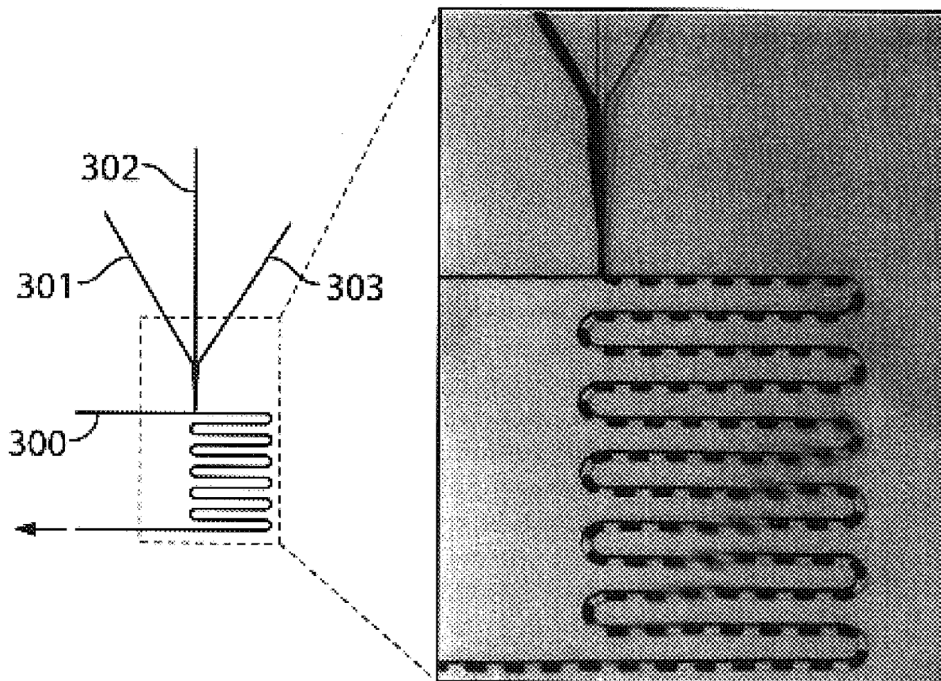
In a section headed, “Fabrication of Channels, Substrates, and Devices,” Ismagilov 091 discusses methods for fabricating microfluidic devices, including a polymer casting method. Ex. 1004, 16:1–7, 16:23–41. According to this method, a negative image of the channels is etched into a crystalline silicon wafer, and the wafer is used as a mold for casting the channels from polydimethylsiloxane (PDMS). *Id.* at 16:23–28. In this method, the silicon wafer mold is placed in the bottom of a Petri dish, uncured PDMS is poured onto the mold, and the PDMS then cured and removed from the mold. *Id.* at 16:30–35. Ismagilov 091 discloses that “[h]oles may be cut into the PDMS using, for example, a tool such as a cork borer or a syringe needle.” *Id.* at 16:35–36. According to Ismagilov 091, the PDMS channels are treated with hydrochloric acid to render the surface hydrophilic. *Id.* at 16:37–38. Ismagilov 091 discloses that the PDMS channels can be “placed onto a microscope cover slip (or any other suitable flat surface), which can be used to form the base/floor or top of the channels.” *Id.* at 16:38–41.

Ismagilov 091 discloses that “[a] substrate containing the fabricated flow channels and other components is preferably covered and sealed, preferably with a transparent cover, e.g., thin glass or quartz, although other clear or opaque cover materials may be used.” Ex. 1004, 16:60–64.



According to Ismagilov 091, the substrate can include “[a] variety of channels for sample flow” as well as “manifolds (a region consisting of several channels that lead to or from a common channel).” *Id.* at 17:10–11, 17:18–20. Such manifolds can “route[] the flow of solution to an outlet.” *Id.* at 17:23–27. Ismagilov 091 discloses that “[t]he outlet can be adapted for receiving, for example, a segment of tubing or a sample tube, such as a standard 1.5 ml centrifuge tube. Collection can also be done using micropipettes.” *Id.* at 17:27–30.

Figure 3A of Ismagilov 091 is reproduced below.



**FIG. 3A**

Ismagilov 091 Figure 3A shows a photograph (right side) and a schematic diagram (left side) depicting a stream of plugs formed from an aqueous plug-fluid and an oil (carrier-fluid) in curved serpentine channels. Ex. 1004, 4:6–10, 18:24–26, Fig. 3A. According to Ismagilov 091, the carrier-fluid is

introduced into inlet port 300 of a substrate, and three aqueous plug-fluids are introduced in separate inlet ports 301, 302, and 303. *Id.* at 18:31–33.

2. *Ismagilov 119 (Ex. 1005)*

Ismagilov 119 is asserted as prior art to the '837 Patent under 35 U.S.C. § 102(a)(2) and pre-AIA § 102(e) as of its March 16, 2005 filing date and under § 102(a)(1) and pre-AIA § 102(a) as of its May 4, 2006 publication date. Pet. 13–14. At this stage, Patent Owner does not contest the prior art status of Ismagilov 119.

Ismagilov 119 discloses a microfluidic system. Ex. 1005, code(54). Ismagilov 091 is incorporated by reference in Ismagilov 119. *Id.* ¶¶ 30, 119. Like Ismagilov 091, Ismagilov 119 refers to droplets as “plugs.” *Id.* ¶ 22, Fig. 13b (showing “aqueous droplets, or plugs” being formed at the junction between “channel a” through which an aqueous stream is pumped and “channel b” though which a carrier fluid is pumped).

Petitioner relies on the following passage from Ismagilov 119:

Plugs can be sorted. For example, the plugs can also be sorted according to their sizes. Alternately, the plugs can be sorted by their density relative to that of the carrier fluid. Alternately, plugs can also be sorted by applying a magnetic field if one group of the plugs contains magnetic materials such as iron or cobalt nanoparticles or ferrofluid.

Ex. 1005 ¶ 123.

3. *Quake (Ex. 1006)*

Quake is asserted as prior art to the '837 Patent under 35 U.S.C. § 102(a)(2) and pre-AIA 35 § 102(e) as of its September 14, 2001 filing date and under § 102(a)(1) and pre-AIA § 102(a) and (b) as of its May 16, 2002 publication date. Pet. 14–15. At this stage, Patent Owner does not contest the prior art status of Quake.

Quake discloses “microfluidic devices and methods,” including devices “designed to compartmentalize small droplets of aqueous solution within microfluidic channels filled with oil.” Ex. 1006 ¶ 3. More specifically, Quake discloses:

The devices and methods of the invention comprise a main channel, through which a pressurized stream of oil is passed, and at least one sample inlet channel, through which a pressurized stream of aqueous solution is passed. A junction or “droplet extrusion region” joins the sample inlet channel to the main channel such that the aqueous solution can be introduced to the main channel, e.g., at an angle that is perpendicular to the stream of oil. By adjusting the pressure of the oil and/or the aqueous solution, a pressure difference can be established between the two channels such that the stream of aqueous solution is sheared off at a regular frequency as it enters the oil stream, thereby forming droplets.

Ex. 1006 ¶ 3; *see also id.* ¶ 84 (describing droplet extrusion region).

Figure 6 of Quake is reproduced below:

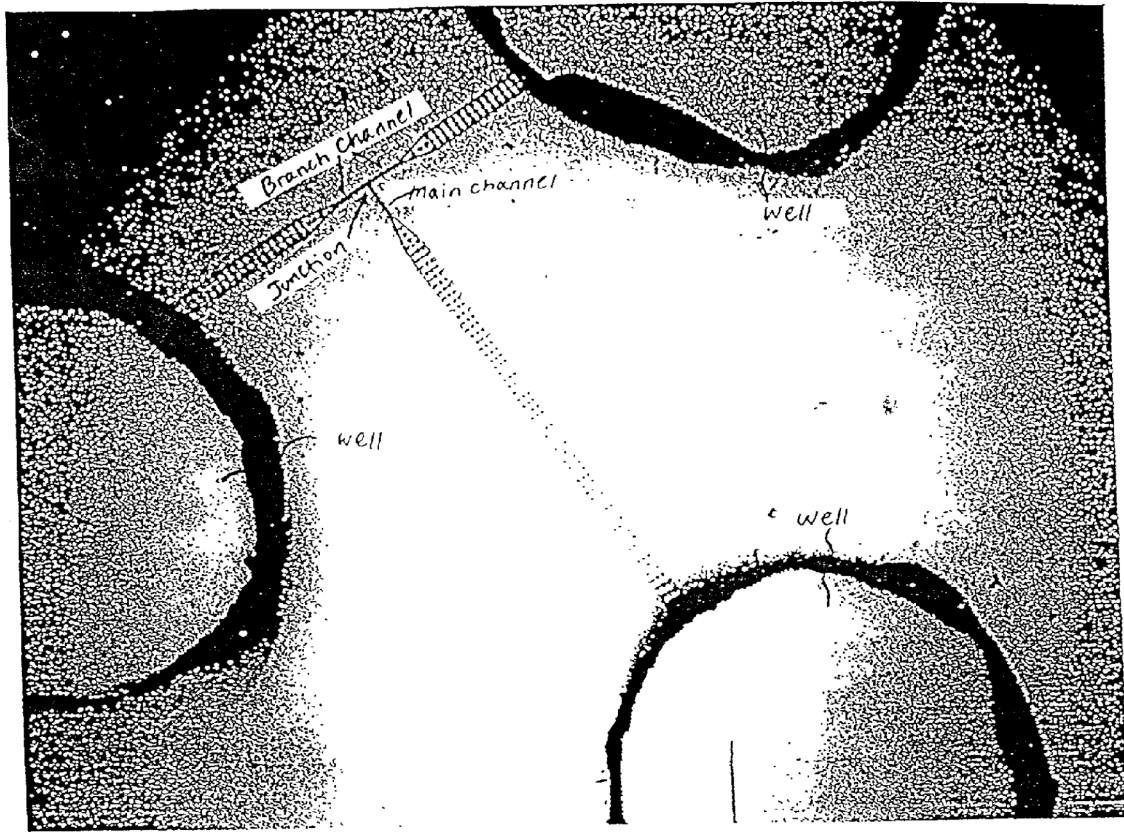


Fig 6

Quake Figure 6 is a photograph showing a microfabricated device (“chip”) with an inlet channel and reservoir (labeled “well” at lower right side of Figure 6), a detection region (labeled “main channel” in Figure 6), a branch point (labeled “junction” in Figure 6), and two outlet channels and reservoirs (each labeled “well” in Figure 6). Ex. 1006 ¶¶ 29, 196.

Quake discloses the process by which the chip of Figure 6 was molded from a silicone elastomer. Ex. 1006 ¶ 196. According to Quake, a negative master mold was made from a silicon wafer by standard photolithography and micromachining techniques. *Id.* ¶¶ 195, 196, Fig. 7 (showing etching process). Elastomer components were mixed together and

poured onto the etched silicon wafer. *Id.* ¶ 196. After curing, the elastomer was peeled from the wafer. *Id.* The chip was treated to make the elastomer surface hydrophilic. *Id.* As shown in Figure 6, an inlet well and two collection wells were incorporated into the elastomer chip on three sides of a “T” arrangement of channels. *Id.* ¶ 197. The elastomer chip was then adhered to a glass coverslip. *Id.* ¶¶ 196, 197.

According to Quake, the device shown in Figure 6 has the following dimensions: The channels “are 100  $\mu\text{m}$  wide at the wells, narrowing to 3  $\mu\text{m}$  at the sorting junction (discrimination region). The channel depth is 4  $\mu\text{m}$ , and the wells are 2 mm in diameter.” Ex. 1006 ¶ 196. Quake discloses that the microfabricated device of Figure 6 can be used in sorting cells or biological materials. *Id.* ¶ 193.

Figure 8 of Quake is reproduced below.

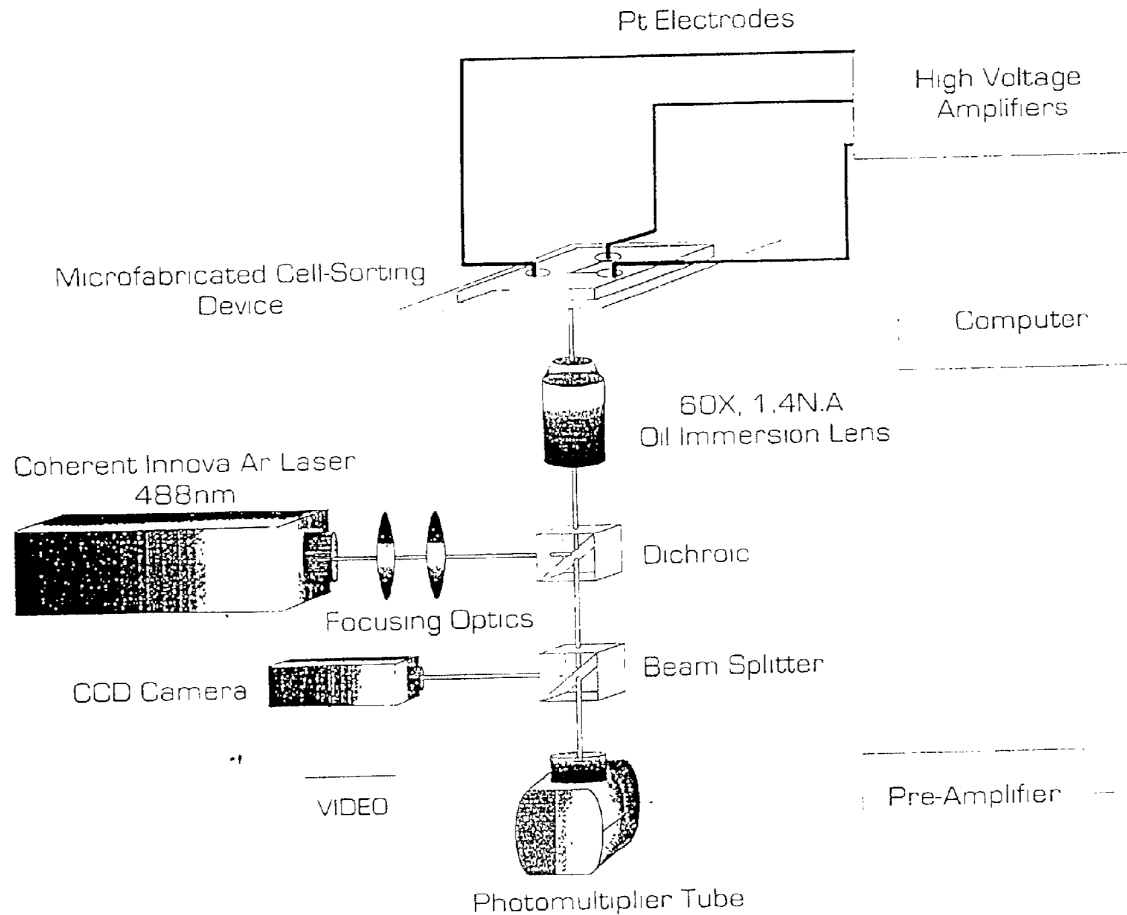


Fig 8

Quake Figure 8 shows a schematic representation of an apparatus for sorting cells or beads using the microfabricated device of Figure 6. Ex. 1006 ¶¶ 31, 197. As shown in Figure 8, the microfabricated cell-sorting device (silicone elastomer chip) was mounted on an inverted microscope for optical detection of fluorescence emission of laser-stimulated cells. *Id.* Electrodes were inserted into each of the three wells (the inlet well and two collection wells) to direct the flow of cells. *Id.* ¶¶ 197, 198, Fig. 8. Responsive to optical detection, voltages on the electrodes were used to direct the cells to one or the other of the collection wells on each side of the “T” junction. *Id.* ¶¶ 31, 198.

4. *Pamula 634 (Ex. 1007); Pamula 238 (Ex. 1018)*

Pamula 634 is asserted as prior art to the '837 Patent under 35 U.S.C. § 102(a)(2) and pre-AIA § 102(e) as of its December 15, 2006 filing date. Pet. 15. This assertion is based on Petitioner's contention that the '837 Patent claims are not supported by the provisional priority applications filed before Pamula 634's filing date. *Id.* at 15–16.

Pamula 238 is asserted as prior art to the '837 Patent under 35 U.S.C. § 102(a)(2) and pre-AIA § 102(e) as of the April 18, 2006 filing date of a provisional application.<sup>9</sup> Pet. 16. According to Petitioner, the disclosures relied upon by Petitioner “are substantially identical between the publication and provisional” and “Pamula 238 includes claims supported by that provisional.” *Id.* (citing Ex. 1018 ¶¶ 418; Ex. 1025, 8–9). At this stage, Patent Owner does not contest the prior art status of Pamula 634 or Pamula 238.

Pamula 634 and Pamula 238 (collectively “Pamula”)<sup>10</sup> discloses a droplet microactuator. Ex. 1007, code (57), ¶¶ 3, 13, 374, Fig. 1.

By way of background, Pamula discusses two types of microfluidic systems. Ex. 1007 ¶ 12. According to Pamula, “continuous-flow systems rely on continuous flow of liquids in channels whereas discrete-flow systems utilize droplets of liquid either within channels or in a channel-less architecture.” *Id.* Pamula identifies various limitations of continuous-flow systems. *Id.* Pamula indicates that a need remains for a system that uses droplet manipulations to carry out multiple tests on a single chip and that can

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<sup>9</sup> Ex. 1025, U.S. Provisional Application No. 60/745,058 (“Pamula 058”).

<sup>10</sup> For the sake of simplicity, we cite only to Pamula 634 (Ex. 1007). Pamula 238 (Ex. 1018) contains the same disclosures as we cite in Pamula 634 (Ex. 1007).

be integrated into a handheld device for use at the point of sample collection, e.g., for bedside blood analysis. *Id.* ¶¶ 11, 12.

Pamula's droplet microactuator includes a substrate with electrodes arranged in arrays, paths, or networks for transporting droplets along the path or network of electrodes. Ex. 1007 ¶¶ 375–381. The droplet microactuator may include a pair of parallel substrates separated by a gap with an array of electrodes on one or both substrates. *Id.* ¶¶ 205, 377, Fig. 6. In that case, “droplets may be interposed in the space between the plates,” and the “[s]pace surrounding the droplets typically includes a filler fluid.” *Id.* ¶ 378. According to Pamula, “[t]he droplet microactuator operates by direct manipulation of discrete droplets, e.g., using electrical fields.” *Id.* ¶ 381.

Pamula states that “[d]iscrete droplet operations obviate the necessity for continuous-flow architecture and all the various disadvantages that accompany such an architecture.” Ex. 1007 ¶ 385. Nevertheless, Pamula discloses that “[t]he droplet microactuator may in some cases be supplemented by continuous flow components” and that “such combination approaches involving discrete droplet operations and continuous flow elements are within the scope of the invention.” *Id.* Pamula states that “in certain other embodiments, various continuous flow elements are specifically avoided in the droplet microactuator.” *Id.* Pamula discloses “microchannels” as an exemplary component that may be excluded from a droplet microactuator. *Id.*

Petitioner relies on paragraph 418 of Pamula, which discloses in relevant part:

The filler fluid may be selected to have a particular density relative to the droplet phase. A difference in density between the



two phases can be used to control or exploit buoyancy forces acting upon the droplets. Examples of two-phase systems useful in this aspect of the invention include water/silicone oil, water/flourinert, and water/fluorosilicone oil. When one phase is buoyant, then that effect can be exploited in a vertical configuration as a means to transport one phase through the other. For example, a waste or collection well can exist at the top or bottom of the droplet microactuator where droplets are delivered to that reservoir by simply releasing them at an appropriate point and allowing them to float or sink to the target destination. Such an approach may be suitable for use in removing reactant from a droplet microactuator, e.g. removing fluid containing amplified nucleic acid for use in other processes.

Ex. 1007 ¶ 418.

*E. Petitioner's Ground 1: Ismagilov 091 Anticipation*

Petitioner contends that Ismagilov 091 anticipates claims 1, 2, 4, 10–13, 19, and 20 and discloses all limitations of these claims under claim interpretations Petitioner attributes to Patent Owner. Pet. 24–25, 31–47. Patent Owner disputes Petitioner's contentions for claim 1, but does not present separate arguments for dependent claims 2, 4, 10–13, 19, and 20. We, therefore, focus our analysis on independent claim 1 and the elements of that claim that are disputed by Patent Owner. For the undisputed limitations of claim 1 and the limitations of the dependent claims, we have reviewed Petitioner's arguments and evidence and determine Petitioner has sufficiently shown that Ismagilov 091 discloses these claim limitations.

Relying on a claim interpretation suggested by Patent Owner's infringement contentions, Petitioner contends that claim element 1.3 is disclosed by Ismagilov 091's well or reservoir ("separation chamber") that communicates with a manifold outlet ("droplet receiving chamber inlet") and has an opening at the top ("droplet receiving outlet") for collecting

fluids by micropipette. Pet. 35–37 (citing Ex. 1004, 9:5–8, 14:36–40, 17:27–30; Ex. 1026, 11).

Petitioner contends that claim element 1.4 is met because Ismagilov 091’s well or reservoir (“separation chamber”) extends up and out of the plane of the glass coverslip and microchannels (“upright to the microchannel and out of the horizontal plane”) and has a volume and depth sufficient to collect multiple droplets and permit collection by micropipette. Pet. 40–41 (citing Ex. 1004, 16:37–41, 17:27–30, 30:2–9).

Petitioner contends that claim element 1.6 (“separation chamber [that] has a wider cross-section than the microchannel cross-section to accumulate a plurality of droplets”) is disclosed by Ismagilov 091’s wells or reservoirs that “collect” plugs. Pet. 44 (citing 8:41–44, 9:5–8, 14:36–38, 17:27–30). Petitioner asserts that, in Ismagilov 091, the droplets are not being accumulated single file in a structure with the cross-section of a channel, but are instead being pooled in a collection vessel that is deep and wide enough to permit removing the droplets with a pipette. *Id.* at 44–45.

Relying on the claim interpretation suggested by Patent Owner’s infringement contentions, Petitioner contends that claim element 1.7 is met because Ismagilov 091’s outlet well or reservoir “collects both a plurality of droplets and a volume of immiscible fluid” and “[t]hose droplets have a density different from that of the immiscible fluid,” meaning that the droplets will separate from the immiscible fluid in the outlet well or reservoir. Pet. 45–46 (citing Ex. 1004, 17:18–30, Figs. 2–10; Ex. 1026, 12–13, 16–20).

Patent Owner argues that “the ‘outlet ports’ of Ismagilov 091 typically act as extensions of the tubing or pipettes that collect the entirety of the ‘solution’ following analysis within the manifolds, not as a ‘chamber’ that

maintains the entirety of the solution contents and droplets.” Prelim. Resp. 23 (citing Ex. 1004, 17:18–30). According to Patent Owner, “[t]here is simply no disclosure in Ismagilov 091 that teaches any chamber with the dimensions and configuration claimed in the ’837 patent.” *Id.* at 24.

Based on the record at this stage of the proceeding, we disagree with Patent Owner’s argument. Under Petitioner’s alternative constructions for “separation chamber” and “droplet receiving outlet” (Pet. 18–19), Petitioner’s mapping of claim 1 to the disclosures of Ismagilov 091 is sufficiently supported by the evidence. As we understand it, Petitioner contends that a “separation chamber” is disclosed by Ismagilov 091’s well or reservoir. *Id.* at 36 (“Ismagilov discloses collection wells or reservoirs that are a separation chamber with a droplet receiving outlet under Bio-Rad’s interpretations.”). Petitioner maps the claimed the “droplet receiving chamber inlet” to Ismagilov 091’s manifold outlet. *Id.* (“the ‘outlet’ of the manifold is the droplet receiving chamber inlet for the wells or reservoirs (separation chambers)”). In our view, Petitioner’s contention is sufficiently supported by the cited disclosures of Ismagilov 091. *Id.* at 35–37 (citing Ex. 1004, 9:5–8, 14:36–40, 17:27–30).

Although Patent Owner argues that Ismagilov 091 does not disclose “any chamber with the dimensions and configuration claimed in the ’837 patent,” Patent Owner does not adequately address Petitioner’s contention that Ismagilov 091 discloses a well or reservoir with an opening at the top into which a micropipette can be inserted, and that this structure discloses a “separation chamber” and “droplet receiving outlet” under Patent Owner’s interpretation of these terms in its infringement contentions. Pet. 36–37 (addressing claim element 1.3); *see also id.* at 40–41, 44–46 (addressing claim elements 1.4, 1.6, and 1.7).

Regarding the dimensions and configuration of Ismagilov 091's well or reservoir, Petitioner contends:

The extension of the well or reservoir out of the horizontal plane of the microchannels is confirmed because the volume of an outlet well or reservoir in Ismagilov must permit collecting multiple droplets and must be large enough that the fluid can be collected by micropipette. . . . A volume sufficient to collect by micropipette must be greater than 0.1  $\mu$ l. . . . By contrast, examples of droplets in Ismagilov are as small as 16 pL, and so this well or reservoir would collect multiple droplets and extend above the channels, which are shown as not having a cross-section that can accommodate multiple droplets. . . . In order to be pipetted, the volume to be collected would need to be deep enough for the pipette to extend into it, and so the wells or reservoirs will extend out of the horizontal plane to permit that.

Pet. 41 (citing Ex. 1004, 17:27–30; Ex. 1008 ¶ 161; Ex. 1040, Ex. 1041, 1).

At this stage, we view Petitioner's evidence and technical reasoning as sufficient to support its contentions regarding the dimensions and configuration of the well or reservoir disclosed by Ismagilov 091.

Accordingly, after considering both parties' arguments and evidence, we determine that Petitioner has shown a reasonable likelihood that it would prevail in showing that at least claim 1 of the '837 Patent is anticipated by Ismagilov 091 under Petitioner's alternative claim constructions, i.e., the constructions Petitioner attributes to Patent Owner based on its infringement contentions.

*F. Petitioner's Ground 2: Ismagilov 091 and Quake*

Petitioner contends that claims 1, 2, 4, 7, 9–13, 19, and 20 are unpatentable over Ismagilov 091 and Quake under claim interpretations Petitioner attributes to Patent Owner. Pet. 24–26. Patent Owner disputes Petitioner's contentions for claim 1, but does not present separate arguments

for dependent claims 2, 4, 7, 9–13, 19, and 20. We, therefore, focus our analysis on independent claim 1 and the elements of that claim that are disputed by Patent Owner. For the undisputed limitations of claim 1 and the limitations of the dependent claims, we have reviewed Petitioner’s arguments and evidence and determine Petitioner has sufficiently shown that Ismagilov 091 in view of Quake discloses or suggests these claim limitations.

*1. Parties’ Contentions*

Petitioner contends that, to the extent a POSA would not have known the structure of features such as Ismagilov 091’s well, a POSA would have been motivated to look to art that further describes the structure of wells, namely Quake. Pet. 25. Petitioner contends that a POSA would have combined the microfluidic configurations, organizations, uses, substrate compositions, and fluids from Ismagilov 091—including placement of wells, reservoirs, or chambers—with the structures and dimensions disclosed for wells or reservoirs, their inlets and outlets, and channels in Quake. *Id.* at 39–40 (citing Ex. 1004, 16:2–47).

Petitioner contends that claim elements 1.0, 1.1, 1.2, and 1.5 are disclosed by Ismagilov 091. Pet. 31–35, 43. Regarding claim element 1.3, Petitioner contends that Quake shows and describes the wells or reservoirs as large, open structures with inlets from channels and electrodes inserted into the open wells. *Id.* at 38 (citing Ex. 1006, ¶¶ 198–200, Figs. 6, 8).

Regarding claim element 1.4, Petitioner contends that Quake confirms that the wells or reservoirs would extend upright and out of the plane of the microchannels. Pet. 42. Petitioner supports this contention with Quake’s disclosed well and channel dimensions, a calculation of the height of

Quake's wells, and Quake's description of how the microfluidic chip is fabricated. *Id.* (citing Ex. 1006 ¶¶ 196–198, 200, Figs. 6–8).

Regarding claim element 1.6, Petitioner cites Quake's well and channel dimensions to show that, in the proposed combination of Ismagilov 091 and Quake, the wells have a wider cross-section than the channels and have a volume that can accumulate a plurality of droplets. Pet. 45 (citing Ex. 1006 ¶ 196).

Regarding claim element 1.7, Petitioner contends that, “given the large size of the wells specified by Quake, . . . the volume of the well or reservoir will be sufficient to separate droplets under Bio-Rad's contentions because it is sufficient to accumulate a plurality of droplets in a volume of immiscible fluid where the droplets have a different density from the immiscible fluid.” Pet. 46–47.

Patent Owner contends that Quake fails to teach a “separation chamber,” as claimed, that a POSA would not have been motivated to combine Ismagilov 091 with Quake, and that secondary considerations support a finding of non-obviousness. We address each of Patent Owner's arguments in the subsections below.

## 2. “*Separation chamber*” and “*droplet receiving outlet*”

Patent Owner argues that the combination of Ismagilov 091 and Quake fails to teach the claimed “separation chamber.” Prelim. Resp. 24–25. Patent Owner asserts that Quake Figures 6 and 8 fail to show that any of the “well” structures (alleged “separation chamber”) have both an inlet and an outlet. *Id.* at 24. According to Patent Owner, “the figures make clear that the ‘wells’ in Quake are part of a closed system, which Quake

makes clear by disclosing that ‘pneumatically-driven syringes’ are used to introduce fluids into the device.” *Id.* (citing Ex. 1004 ¶¶ 288, 300).

Based on the record at this stage of the proceeding, we disagree with Patent Owner’s argument. In our view, Petitioner has shown sufficiently that Ismagilov 091 in view of Quake teaches a “separation chamber” having a “droplet receiving outlet” under Petitioner’s alternative constructions for these terms. Pet. 18–19. Patent Owner’s counterargument is belied by Quake Figure 8, which shows three open-topped wells with electrodes inserted into the wells. Ex. 1006, Fig. 8, ¶ 198 (“Three platinum electrodes were each inserted into separate wells.”). Quake makes clear that the three open-topped wells shown in Figure 8 are the inlet well and two collection wells shown in Figure 6. *Id.* ¶ 197 (“The inlet well and two collection wells were incorporated into the elastomer chip on three sides of the ‘T’ forming three channels (FIGS. 6 and 7).”). Petitioner relies on Quake to show the structure of the wells or reservoirs disclosed in Ismagilov 091, including the output well of Ismagilov 091. Pet. 39–40. In Petitioner’s combination, the “droplet receiving outlet” corresponds to the open top of Quake’s well, which allows removal of fluids by micropipette, as described in Ismagilov 091. *Id.* at 36–37, 40 (“The structure of the output well of Ismagilov in the combination would have an opening as in Quake, and just as fluids could be added to the Quake well, so too could they be removed through the opening as described by Ismagilov.”).

Although Patent Owner argues that Quake discloses a “closed system,” citing Quake’s disclosure of “pneumatically-driven syringes” (Prelim. Resp. 24 (citing Ex. 1006 ¶¶ 288, 300)), the cited disclosures relate to a different embodiment than Petitioner relies upon to show open-topped wells. *Compare* Ex. 1006 ¶¶ 192–214, Figs. 6–12, Example 7

(microfabricated device comprising an elastomer chip and a glass coverslip), *with id.* ¶¶ 271–312, Figs. 16–20, Examples 10–12 (microfabricated devices comprising two or three elastomeric layers). Moreover, at this stage, Patent Owner’s argument appears to be inconsistent with Quake’s disclosure that the Figure 6 embodiment (with open-topped wells) can be used in a pressure-driven mode. *Id.* ¶ 197 (“the flow control can be provided by voltage electrodes for electro-osmotic control or by capillaries for pressure-driven control”).

### 3. *Motivation to Combine*

Patent Owner challenges the sufficiency of Petitioner’s asserted motivation to combine Ismagilov 091 and Quake, arguing that “Petitioner provides no explanation of *why* a POSA would have been motivated other than that both researchers were known in the field.” Prelim. Resp. 25. Continuing, Patent Owner argues “Petitioners provide no explanation for how a POSA would go about combining the disparate elements of the references, or what modifications a POSA would necessarily have made in order to combine the disparate elements.” *Id.* at 25–26.

After considering Patent Owner’s arguments, we determine that Petitioner’s contentions regarding a motivation to combine Ismagilov 091 and Quake include an explanation for how and why a POSA would have combined the cited teachings sufficient to meet the threshold for institution of *inter partes* review. Essentially, Petitioner contends that Quake provides additional details regarding structures—wells or reservoirs, their inlets and outlets, and channels—that Petitioner contends are also disclosed by Ismagilov 091. Pet. 25, 39–40. In other words, Petitioner is not combining “disparate elements,” as argued by Patent Owner. Prelim. Resp. 25–26.



Instead, Petitioner is relying on Quake to provide explicit disclosure of structural and functional details, such as the relative dimensions of wells and channels, that Petitioner contends is implicitly or inherently described by Ismagilov 091.

As support for a motivation to combine, Petitioner cites Ismagilov 091's description of fabrication of channels, substrates, and devices. Pet. 40 (citing Ex. 1004, 16:2–47). That description is similar to Quake's description of fabrication of a microfabricated device that Petitioner relies upon to provide additional details regarding the dimensions and configuration of the wells or reservoirs, their inlets and outlets, and channels. Pet. 38–39, 41–42, 45 (citing Ex. 1006 ¶¶ 196–200, Figs. 6–8). Accordingly, in this case, the similarities between the references support Petitioner's rationale for combining their teachings.

#### *4. Secondary Considerations*

Patent Owner contends that secondary considerations, including long-felt need, commercial success, praise, and acquiescence and licensing weigh in favor of a finding of nonobviousness of the '837 claims. Prelim. Resp. 27–34.

Patent Owner contends that Bio-Rad's products<sup>11</sup> fulfilled a long-felt need, have been a commercial success, and have been praised for their

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<sup>11</sup> We note that the original assignee of the '837 Patent was RainDance Technologies, Inc., not Bio-Rad. Ex. 1001, code(73). According to Patent Owner, Bio-Rad acquired the '837 Patent in 2017, after the launch of Bio-Rad's products that allegedly practice the '837 Patent. Prelim. Resp. 32, 34; Ex. 2014. Although Patent Owner mentions "RainDance's patented droplet system" (Prelim. Resp. 28), the bulk of Patent Owner's secondary considerations arguments pertain to Bio-Rad's and Petitioner's products (*id.* at 29–34), not RainDance's products.

contributions to the field. Prelim. Resp. 29–34; Exs. 2001–2011, 2013. At this stage, Patent Owner does not direct us to evidence sufficient to show a nexus between Bio-Rad’s products and the ’837 Patent claims. Patent Owner’s naked assertion that Bio-Rad’s products “practice” and “embody” the ’837 Patent is not sufficient to show nexus. Prelim. Resp. 29, 30. *See, e.g., Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (“In order to accord substantial weight to secondary considerations in an obviousness analysis, the evidence of secondary considerations must have a nexus to the claims, i.e., there must be a legally and factually sufficient connection between the evidence and the patented invention.”) (internal quotes omitted); *see also Lectrosonics, Inc. v. Zaxcom, Inc.*, Case IPR2018-01129, Paper 33, at 32 (PTAB Jan. 24, 2020) (precedential) (“For objective indicia of nonobviousness to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention.”).

Patent Owner also contends that Petitioner’s “products embodying the invention have been a commercial success.” Prelim. Resp. 32; Ex. 2012. Again, Patent Owner does not direct us to evidence sufficient to show a nexus between Petitioner’s products and the ’837 Patent claims.

Patent Owner asserts that “Bio-Rad acquired RainDance and all of its intellectual property in January 2017, including the ’837 patent, demonstrating the value that third-parties have placed on acquiring rights to the ’837 patent.” Prelim. Resp. 34 (citing Ex. 2014). Yet again, Patent Owner does not direct us to evidence sufficient to show a nexus between the ’837 Patent claims and Patent Owner’s acquisition of RainDance and its intellectual property.

Patent Owner argues that the Petition should be denied because Petitioner was “aware of these secondary considerations from a previous litigation at the International Trade Commission” but has not offered any rebuttal to them. Prelim. Resp. 28. Patent Owner, however, does not identify the International Trade Commission litigation, which is not disclosed as a related matter. Patent Owner submits no evidence supporting its contention that Petitioner was aware of Patent Owner’s arguments or evidence pertaining to secondary considerations.

Accordingly, at this stage of the proceeding, based on the current record, Patent Owner’s arguments and evidence concerning secondary considerations are not persuasive of non-obviousness.

#### *5. Conclusion regarding Ground 2*

After considering both parties’ arguments and evidence, we determine that Petitioner has shown a reasonable likelihood that it would prevail in showing that at least claim 1 of the ’837 Patent is unpatentable over Ismagilov 091 and Quake under Petitioner’s alternative claim constructions, i.e., the constructions Petitioner attributes to Patent Owner based on its infringement contentions.

#### *G. Petitioner’s Grounds 3–5: Ismagilov 119 alone or in view of Pamula*

Petitioner contends that claims 1–4, 7–13, and 19–20 are unpatentable over Ismagilov 119, alone or in view of Pamula, based either on Petitioner’s proposed claim constructions (Grounds 3a–5a) or the claim constructions Petitioner attributes to Patent Owner (Grounds 3b–5b). Pet. 24–25, 56–71.

We determine that Petitioner’s Grounds 3–5 are flawed for the reasons discussed below.

*1. Grounds 3–5: Claim Construction*

Petitioner’s analysis of Ismagilov 119 and Pamula focuses entirely on Petitioner’s proposed claim constructions. *See* Pet. 56–71 (discussing Grounds 3a–5a). Petitioner presents no analysis of these references based on the claim constructions that Petitioner attributes to Patent Owner. *See id.* Instead, Petitioner merely asserts that “all of the evidence discussed in detail below also invalidates . . . under Bio-Rad’s broader constructions” and that “10X’s claim constructions are narrower, and thus the evidence of the more specific disclosures 10X identified equally invalidate under Bio-Rad’s broader views.” *Id.* at 56. That two-sentence argument is not sufficient to present a ground of unpatentability based on the claim constructions that Petitioner attributes to Patent Owner as asserted in Grounds 3b–5b.

Accordingly, we view Petitioner’s Grounds 3–5 as based solely on Petitioner’s proposed claim constructions. For the reasons discussed above, we do not adopt Petitioner’s claim constructions. Because Petitioner’s Grounds 3–5 are based solely on an incorrect claim construction, Petitioner has not shown a reasonable likelihood of prevailing on these grounds.

*2. Ground 3: Ismagilov 119 Alone*

Claim element 1.3 recites: “at least one downstream separation chamber comprising a droplet receiving chamber inlet and at least one droplet receiving outlet.” Ex. 1001, 88:10–12.

Petitioner contends that claim element 1.3 is rendered obvious by Ismagilov 119’s disclosure that “the plugs can be sorted by their *density* relative to that of the carrier fluid.” Pet. 57 (quoting Ex. 1005 ¶ 123). More specifically, Petitioner contends:

Based on the knowledge of one of ordinary skill, a POSA would already be familiar with the features of a system to sort

droplets based on density. As described in section VI [of the Petition], droplets either float (cream) or sink (sediment) *if they were placed in a large vessel* such that the droplets and continuous phase liquid could move freely past each other if they had different densities. The above quote from Ismagilov 119 described a density difference between the carrier fluid and the droplets. Also, there was a density difference based on the fluids disclosed in Ismagilov, as described in section VI, and a POSA could have observed the droplets floating in the oil. *The chamber itself would be a large volume* to collect multiple droplets and allow them to move freely through the continuous oil phase to form a fraction enriched for droplets, as was well-known for emulsions. *A chamber or reservoir would need to extend vertically* to permit the density sorting to occur over the distance parallel with the force of gravity. For the chamber to operate to remove the fraction of floating droplets, *an outlet is placed at the top of the chamber to collect the droplets*. This would allow the droplet enriched fraction to be collected, which would mean that substantially only droplets would be entering the outlet. There would also be an outlet on the bottom for unwanted fluids (e.g., immiscible fluid) to exit and avoid it overflowing into the outlet for the droplets.

The space of the chamber would be enclosed *except for the inlet and outlet* to allow the droplets to be extracted (e.g., from the top of the chamber).

*Id.* at 57–58 (citing Ex. 1008 ¶¶ 136–144) (emphasis added).

The foregoing contention is an attempt to extrapolate from a single sentence in Ismagilov 119—“the plugs can be sorted by their density relative to that of the carrier fluid”—a teaching or suggestion of a separation chamber comprising a droplet receiving chamber inlet and at least one droplet receiving outlet, as recited in claim element 1.3. In our view, however, this single sentence cited from Ismagilov 119 does not identify any particular structure at all, much less the recited “separation chamber” having a “droplet receiving chamber inlet” and a “droplet receiving outlet.”

In our view, Petitioner’s analysis improperly relies on hindsight and conclusory assertions about the knowledge of a POSA to supply multiple important claim limitations that are missing from the cited disclosure of Ismagilov 119. *See KSR*, 550 U.S. 421 (in reaching a conclusion of obviousness, “hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning” must be avoided); *DSS Technology Management v. Apple, Inc.*, 885 F.3d 1367, 1374 (Fed. Cir. 2018) (“In cases in which ‘common sense’ is used to supply a missing limitation, as distinct from a motivation to combine, . . . our search for a reasoned basis for resort to common sense must be searching.”); *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1367 (Fed. Cir. 2016) (reversing Board’s determination of obviousness where “the missing limitation is not a ‘peripheral’ one, and there is nothing in the record to support the Board’s conclusion that supplying the missing limitation would be obvious to one of skill in the art”).

Petitioner misreads the sentence it relies upon as the lynchpin of its obviousness contention. Ismagilov 119 discloses that “plugs can be sorted by their density relative to that of the carrier fluid.” Ex. 1005 ¶ 123. Dr. Fair opines “[t]his means that, based on the difference in densities between the droplets and the carrier fluid, the droplets are substantially separated from the carrier fluid.” Ex. 1008 ¶ 136. According to Petitioner and Dr. Fair, this passage “refers to only two things in the sorting: the droplets that are referred to as having one density, and the carrier fluid that is referred to as having a different relative density.” Pet. 57; Ex. 1008 ¶ 136.

We disagree with the hindsight-based interpretation advanced by Petitioner and Dr. Fair. The sentence from Ismagilov 119, paragraph 123 describes **sorting** plugs, **not separating** plugs from carrier fluid. Our

understanding is consistent with the entirety of Ismagilov 119, paragraph 123, which reads:

Plugs can be sorted. For example, the plugs can also be sorted according to their sizes. Alternately, the plugs can be sorted by their density relative to that of the carrier fluid. Alternately, plugs can also be sorted by applying a magnetic field if one group of the plugs contains magnetic materials such as iron or cobalt nanoparticles or ferrofluid.

Ex. 1005 ¶ 123. Paragraph 123 begins with the general statement that “[p]lugs can be sorted.” *Id.* Each sentence that follows that general statement is an “example” of how plugs can be sorted. *Id.* Accordingly, sorting plugs “by their density relative to that of the carrier fluid” is reasonably interpreted to mean separating the plugs *from each other* based on their density relative to the carrier fluid as opposed to separating plugs from the immiscible fluid. For example, plugs that float in the carrier fluid can be sorted from plugs that sink in the carrier fluid without separating the plugs from the carrier fluid.

Petitioner’s obviousness case hinges on the proposition that a POSA would understand that a “separation chamber” would be necessary to carry out the “sorting by density” that is described in Ismagilov 119. *See* Ex. 1008 ¶ 140 (“a person of ordinary skill in the art would know that all that would be required to perform such density-based sorting would be a relatively simple chamber with a sufficiently large volume to collect multiple droplets and allow them to move freely through the continuous oil phase to form a separate fraction enriched for droplets”).

In our view, Petitioner’s evidence is not sufficient to justify a leap from density-based sorting, as disclosed in Ismagilov 119, to a “separation chamber” in which droplets are separated from immiscible fluid, as recited

in claim 1. Petitioner directs us to no disclosure or suggestion, either in Ismagilov 091 or Ismagilov 119, that the density-based sorting mentioned in paragraph 123 takes place in a chamber or reservoir. Moreover, Ismagilov 091 suggests that sorting occurs in microchannels, not in a separation chamber. Ex. 1004, 17:10–13 (“*A variety of channels* for sample flow and mixing can be fabricated on the substrate and can be positioned at any location on the substrate, chip, or device as the detection and discrimination or *sorting points*.”); *id.* at 21:55–59 (“[O]ne or more plugs are detected, analyzed, characterized, or *sorted* dynamically *in a flow stream of microscopic dimensions* based on the detection or measurement of a physical or chemical characteristic, marker, property, or tag.”) (emphases added). As such, Petitioner has not sufficiently shown that Ismagilov 119 teaches a separation chamber comprising a droplet receiving chamber inlet and at least one droplet receiving outlet, as recited in claim element 1.3.

For these same reasons, Petitioner has not sufficiently shown that Ismagilov 119 describes a the separation chamber that is “is upright to the microchannel and out of the horizontal plane” as required by claim element 1.4, that “has a wider cross-section than the microchannel cross-section” as recited in claim element 1.6, or that “is of a volume sufficient to separate the plurality of droplets . . . from the immiscible fluid . . .” as recited in claim element 1.7. Ex. 1001, 88:10–14, 88:18–23; Pet. 64, 66–67.

Therefore, for the reasons discussed above, Petitioner has not shown a reasonable likelihood of prevailing on its contention that claims 1–4, 7–13, and 19–20 are unpatentable over Ismagilov 119 based on Petitioner’s proposed claim constructions.



3. *Grounds 4 and 5: Ismagilov 119 and Pamula*

Petitioner contends that a POSA would have combined Ismagilov 119's teaching of "density separation" with Pamula's description of "sorting droplets based on a difference in density between the droplets and the carrier fluid." Pet. 60–61 (citing Ex. 1007 ¶ 418; Ex. 1018 ¶ 418; Ex. 1025, 8–9). More specifically, Petitioner contends that a "POSA would have been able to apply Pamula's teachings of a density separation chamber with an outlet (collection well) at the top to Ismagilov's system which itself already included the use of both outlet wells and density-based sorting of droplets from oil." *Id.* at 61; Ex. 1008 ¶ 156 (same).

Patent Owner argues that Petitioner fails to show that Pamula discloses a separation chamber. Prelim. Resp. 25. In addition, Patent Owner argues Petitioner's motivation to combine Ismagilov 119 and Pamula is conclusory and hindsight-based reasoning. *Id.* at 27.

In our view, Petitioner's unpatentability contentions based on Ismagilov 119 and Pamula do not meet the threshold for institution of *inter partes* review for several reasons.

First, based on the present record, Petitioner has not sufficiently shown a reason why a skilled artisan would have combined the distinct teachings of Ismagilov 119 and Pamula absent the use of impermissible hindsight. In contrast to Ismagilov 119, which discloses that droplets "can be sorted by their density relative to that of the carrier fluid" (Ex. 1005 ¶ 123), Pamula does not disclose sorting droplets. Instead, Pamula discloses separating aqueous droplets from the filler phase, e.g., silicone oil, by allowing them to float or sink to a target destination. *See, e.g.*, Ex. 1007

¶ 418.<sup>12</sup> In view of these differences, Petitioner’s combination appears to be motivated by impermissible hindsight, rather than reasoning that would have been employed upon by a POSA who had not seen claim 1 and the supporting disclosure of the ’837 Patent. *In re Gorman*, 933 F.2d 982, 987 (Fed. Cir. 1991) (“It is impermissible . . . simply to engage in a hindsight reconstruction of the claimed invention, using the applicant’s structure as a template and selecting elements from references to fill the gaps.”).

Second, it is unclear whether Petitioner contends that a POSA would have used Pamula’s vertical collection well: (1) as Ismagilov 119’s density sorter or (2) as Ismagilov 119’s outlet well. *See* Pet. 61; Ex. 1008 ¶ 156. Either way, Petitioner and Dr. Fair fail to explain sufficiently how and why a POSA would have combined Ismagilov 119’s channel-based flow elements with Pamula’s discrete-flow system and vertical collection well. *See Metalcraft of Mayville, Inc. v. Toro Co.*, 848 F.3d 1358, 1367 (Fed. Cir. 2017) (“Without any explanation as to how or why the references would be combined to arrive at the claimed invention, we are left with only hindsight bias that *KSR* warns against.”).

Third, Petitioner’s contention that a POSA “**would have been able to** apply Pamula’s teachings . . . to Ismagilov’s system” (Pet. 61; Ex. 1008 ¶ 156, emphasis added) is improperly “focused on what a skilled artisan would have been able to do, rather than what a skilled artisan would have been motivated to do at the time of the invention.” *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1068 (Fed. Cir. 2018).

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<sup>12</sup> For the sake of simplicity, we cite only to Pamula 634 (Ex. 1007). Pamula 238 (Ex. 1018) and Pamula 058 (Ex. 1025) contain the same disclosures as we cite in Pamula 634 (Ex. 1007).

For these reasons, Petitioner has not shown a reasonable likelihood of prevailing on its contention that claims 1–4, 7–13, and 19–20 are unpatentable over Ismagilov 119 and Pamula.

#### *H. Patent Owner’s Redundancy Argument*

Patent Owner argues that we should deny institution “because Petitioner included multiple, redundant grounds with no meaningful distinction between them.” Prelim. Resp. 18. According to Patent Owner, “Grounds 3–5 are horizontally redundant of Ground 2 because they rely on a different set of references to argue obviousness without a sufficient explanation from Petitioner as to the circumstances under which each ground is stronger or weaker.” *Id.* at 19. Patent Owner continues that “Grounds 3–5 are vertically redundant of each other because they each rely on Ismagilov 119 in combination with different secondary references.” *Id.*

We are not persuaded by Patent Owner’s redundancy arguments. As discussed above, we view Petitioner’s Grounds 3–5 as based solely on Petitioner’s proposed claim constructions, and Petitioner’s Ground 2 relies on the claim constructions that Petitioner attributes to Patent Owner based on its infringement contentions. For this reason, Grounds 3–5 are not redundant of Ground 2.

Moreover, Patent Owner relies on *Interthinx, Inc. v. Corelogic Solutions, LLC*, CBM2012-00007, Paper 20 (PTAB Feb. 25, 2013) and *Liberty Mutual Ins. Co. v. Progressive Casualty Ins. Co.*, CBM2012-00003, Paper 7 (PTAB Oct. 25, 2012). Prelim. Resp. 3–4, 18. *Interthinx*, however, involved the Board’s exercise of discretion to **deny a subset** of challenges after finding the denied challenges were cumulative to challenges for which review was instituted. Similarly, in *Liberty Mutual Ins.*, the Board held it

would not consider all of the grounds asserted in the petition and ordered the petitioner to identify a *subset* of challenges that it wished the Board to consider. Following the Supreme Court’s decision in *SAS Institute Inc. v. Iancu*, 138 S. Ct. 1348 (2018), and as explained in the *Consolidated Trial Practice Guide*, the Board will not institute on fewer than all claims or all challenges in a petition. CTPG 5, 64; *see also id.* (stating the Board will either institute as to all claims challenged in the petition and on all grounds in the petition, or institute on no claims and deny institution). Based on the circumstances of this proceeding, we do not consider the number of grounds to be so excessive as to warrant discretionary denial of the Petition.

Accordingly, we do not deny institution based on Patent Owner’s redundancy argument.

*I. Patent Owner’s Parallel Petitions Argument*

Patent Owner argues that we should deny the 086 Petition “because petitioner filed parallel petitions on the same day.” Prelim. Resp. 20. According to Patent Owner, “Petitioner’s filing of the 086 and 087 Petitions on the same day attacking largely the same claims of the same patent . . . places a substantial and unnecessary burden on the Board and Patent Owner.” *Id.* Patent Owner argues that we “should deny the 086 Petition because Petitioner did not explain sufficiently why the Board should exercise its discretion and institute both the 086 and 087 Petitions.” *Id.* at 21.

We are not persuaded by Patent Owner’s parallel petitions argument. Petitioner summarizes the differences between the 086 and 087 Petitions in its Notice of Ranking. Paper 3 at 4. According to Petitioner, the 086 Petition relies on Ismagilov 091 and Ismagilov 119 as primary references,

and the 087 Petition relies on Thorsen as a primary reference. *Id.*

According to Petitioner, for the 086 Petition, it is “[p]ossible that Bio-Rad will try to swear behind” the Ismagilov references, and for the 087 Petition, “Bio-Rad cannot try to swear behind” the Thorsen reference “as a matter of law.” *Id.*; *see also id.* at 2 (“the two petitions proceed on different primary references and differ materially with respect to the earliest date to which the asserted prior art is entitled to claim priority”); *id.* at 3 (“[I]f Bio-Rad should somehow succeed at claiming Pre-AIA status, Bio-Rad might try to defeat Petition 1 by alleging an earlier date of invention, but would be unable to do so with respect to Thorsen in Petition 2.”).

Patent Owner does not address Petitioner’s identification of the prior art status of the asserted references as a difference between the 086 and 087 Petitions. Nor does Patent Owner state whether or not it will try to swear behind the Ismagilov references. Patent Owner does, however, preserve its ability to swear behind the Ismagilov references by arguing that the AIA does not apply to the ’837 Patent. Prelim. Resp. 34–35.<sup>13</sup>

The *Consolidated Trial Practice Guide* states that circumstances in which more than one petition challenging the same patent may be necessary include: “when there is a dispute about priority date requiring arguments under multiple prior art references,” although such cases “should be rare.” CTPG 59. To avoid institution of two parallel petitions, Patent Owner could have agreed not to dispute Petitioner’s contention that the Ismagilov references are prior art to the ’837 Patent, thereby eliminating Petitioner’s

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<sup>13</sup> Because Patent Owner does not attempt to swear behind any of Petitioner’s references at this stage of the proceeding, we do not need to decide whether or not the AIA applies to the ’837 Patent for purposes of this Decision.

alleged difference between the 086 and 087 Petitions. Paper 3 at 4. Because Patent Owner did not do so, Petitioner's alleged difference is sufficient to justify institution of two parallel petitions challenging the '837 Patent. CTPG 59.

### III. CONCLUSION

After considering the evidence and arguments presented, we determine the information presented establishes a reasonable likelihood that Petitioner would prevail in showing that at least one claim of the '837 Patent is unpatentable. Accordingly, we institute *inter partes* review of all claims on all grounds asserted in the Petition. At this stage of the proceeding, we have not made a final determination with respect to the patentability of any challenged claim or any underlying factual or legal issues.

### IV. ORDER

It is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–4, 7–13, 19, and 20 of the '837 Patent is instituted with respect to all grounds of unpatentability asserted in the Petition commencing on the entry date of this Decision; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of trial.

IPR2020-00086  
Patent 9,562,837 B2

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