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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

10X GENOMICS, INC.,
Petitioner,

v.

RAINDANCE TECHNOLOGIES, INC.,
Patent Owner.

Case IPR2015-01558
Patent 8,658,430 B2

Before MICHAEL P. TIERNEY, *Vice Chief Administrative Patent Judge*, TINA E. HULSE and ELIZABETH M. ROESEL, *Administrative Patent Judges*.

ROESEL, *Administrative Patent Judge*.

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

In this *inter partes* review, instituted pursuant to 35 U.S.C. § 314, 10X Genomics, Inc. ("Petitioner") challenges the patentability of claims 1–17 of U.S. Patent No. 8,658,430 B2 (Ex. 1001, "the '430 patent"), assigned to RainDance Technologies, Inc. ("Patent Owner").

We have jurisdiction under 35 U.S.C. § 6. This final written decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–17 of the '430 patent are unpatentable.

I. BACKGROUND

A. Procedural History

On July 8, 2015, Petitioner filed a Petition requesting *inter partes* review of claims 1–17 of '430 patent. Paper 2 ("Pet."). On November 2, 2015, Patent Owner filed a Preliminary Response. Paper 11 ("Prelim. Resp.").

On January 19, 2016, we instituted *inter partes* review of claims 1–17. Paper 13 ("Institution Decision" or "Dec.").

On February 2, 2016, Patent Owner filed a request for rehearing of our Institution Decision. Paper 15. On February 24, 2016, we denied rehearing. Paper 18 ("Rehearing Decision" or "Rhg. Dec.")

On April 25, 2016, Patent Owner filed a Patent Owner Response. Paper 21 ("PO Resp."). On July 14, 2016, Petitioner filed a Reply to Patent Owner's Response. Paper 26 ("Pet. Reply").

Petitioner submitted a Declaration of Wilhelm T.S. Huck, Ph.D. with the Petition. Ex. 1002. On April 13, 2016, Patent Owner cross-examined Dr. Huck and filed a transcript of the deposition testimony as Exhibit 2015.

With the Patent Owner Response, Patent Owner submitted a Declaration of Todd Squires, Ph.D. (Ex. 2012) and a Declaration of Darren Link, Ph.D. (Ex. 2014). Petitioner cross-examined Drs. Squires and Link and filed transcripts of the deposition testimony as Exhibit 1030 and Exhibit 1037.

Petitioner submitted a Second Declaration of Wilhelm T.S. Huck, Ph.D. with the Reply. Ex. 1036. On August 23, 2016, Patent Owner again cross-examined Dr. Huck and filed a transcript of the deposition testimony as Exhibit 2017. On August 31, 2016, Patent Owner filed a Motion for Observations on the Cross-Examination of Dr. Huck. Paper 37. On September 7, 2016, Petitioner filed a Response to Patent Owner's Motion for Observations on the Cross-Examination of Dr. Huck. Paper 40.

An oral hearing was held September 27, 2016. A transcript of the hearing was entered in the record. Paper 45 ("Tr.").

B. Related Proceedings

The parties identify *RainDance Techologies, Inc. v. 10X Genomics, Inc.*, 1:15-cv-00152-RGA (D. Del. Feb. 12, 2015) as a related matter involving the '430 patent. Pet. 51; Paper 19.

C. The '430 Patent (Ex. 1001)

The '430 patent relates to a method for droplet formation. Ex. 1001, 16:20 (claim 1). As summarized in the Abstract,

> [T]he invention provides methods for manipulating droplet size that include forming droplets of aqueous fluid surrounded by an immiscible carrier fluid, and manipulating droplet size during the forming step by adjusting pressure exerted on the aqueous fluid or the carrier fluid.

Id. (Abstract); *id.* at 2:28–32 (same). According to the '430 patent, the method can be conducted in microfluidic channels of a microfluidic chip.

Id. at 2:45–46, 3:7–8. As explained in the background section of the '430 patent, microfluidic devices are useful for performing biological, chemical, and diagnostic assays. *Id.* at 1:26–27. Such devices include a substrate that is etched or molded to form channels for carrying one or more sample fluids and an immiscible carrier fluid. *Id.* at 1:27–31.

An exemplary device for droplet formation is shown in Figures 1 and 2 of the '430 patent:

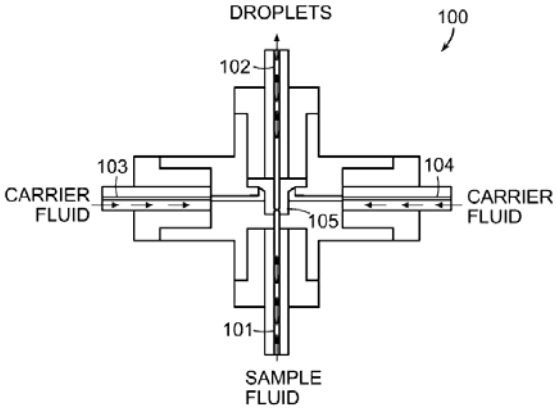

FIG. 1

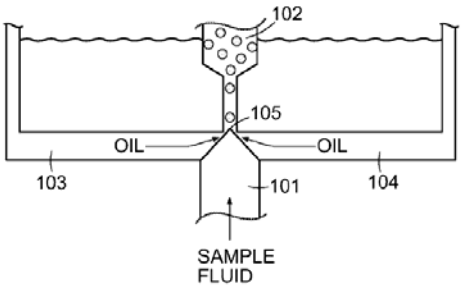

FIG. 2

Figures 1 and 2 are drawings showing a device for droplet formation. *Id.* at 3:33–34, 4:22–23, 4:28–30. As shown in Figure 1, device 100 includes inlet channel 101, outlet channel 102, and carrier fluid channels 103 and 104, all four of which meet at junction 105. *Id.* at 4:23–25. A sample fluid flows through inlet channel 101, and a carrier fluid that is immiscible with the sample fluid flows through channels 103 and 104. *Id.* at 4:26–28. Droplets are formed at junction 105, where the sample fluid interacts with the carrier fluid to form droplets of sample fluid surrounded by immiscible carrier fluid, which are received by outlet channel 102. *Id.* at 4:31–36. According to the '430 patent, the sample fluid is typically an aqueous buffer solution, and the

carrier fluid can be a non-polar solvent, such as fluorocarbon oil. *Id.* at 4:37–46.

D. Illustrative Claim

Claim 1 of the '430 patent, the sole independent claim, is reproduced below:

> 1. A method for droplet formation, the method comprising the steps of:
>
> providing a plurality of aqueous fluids each in its own aqueous fluid channel in fluid communication with one or more immiscible carrier fluid channels;
>
> forming droplets of aqueous fluid surrounded by an immiscible carrier fluid in the aqueous fluid channels;
>
> applying a same constant pressure to the carrier fluid in each of the immiscible carrier fluid channels; and
>
> adjusting pressure in one or more of the aqueous fluid channels, thereby to produce droplets of aqueous fluid in one or more outlet fluid channels.

Ex. 1001, 16:20–31.

E. Petitioner's Asserted References

Petitioner's patentability challenges are based on the following references:

Link et al., US 2008/0014589 A1, published Jan. 17, 2008 (Ex. 1004, "Link"); and

Nam-Trung Nguyen et al., *Optical Detection for Droplet Size Control in Microfluidic Droplet-Based Analysis Systems*, 117 SENSORS AND ACTUATORS B 431–36 (2006) (Ex. 1006, "Nguyen").

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