

**IN THE UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF ILLINOIS  
EASTERN DIVISION**

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|--|---|--------------------|
| SONIX TECHNOLOGY CO., LTD.,              | ) |                    |
|  | ) |                    |
| Plaintiff,                               | ) |                    |
|  | ) |                    |
| v.                                       | ) | Case No. 13 C 2082 |
|  | ) |                    |
| PUBLICATIONS INTERNATIONAL, LTD.,        | ) |                    |
| SD-X INTERACTIVE, INC., ENCYCLOPAEDIA    | ) |                    |
| BRITANNICA, INC., and HERFF JONES, INC., | ) |                    |
|  | ) |                    |
| Defendants.                              | ) |                    |

**MEMORANDUM OPINION AND ORDER**

AMY J. ST. EVE, District Court Judge:

Defendants Publications International, Ltd. (“PIL”), SD-X Interactive, Inc. (“SD-X”), Encyclopaedia Britannica, Inc. (“Britannica”), and Herff Jones, Inc. (“Herff Jones”) (hereinafter “Defendants”) move to bar certain aspects of the testimony of Plaintiff Sonix Technology Co.’s (“Sonix”) technical expert Dr. Amit Ashok pursuant to the Federal Rules of Evidence and *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993). For the following reasons, the Court, in its discretion, grants in limited part and denies in part Defendants’ motion.

**BACKGROUND**

**I. Factual Background**

On March 8, 2013, PIL and SD-X filed a lawsuit seeking declaratory judgment of non-infringement and invalidity of United States Patent No. 7,328,845 (“the ‘845 patent”), against Sonix, the owner of the ‘845 patent. On March 18, 2013, Sonix, a Taiwanese company that designs and develops integrated circuits and related products, filed the present lawsuit involving

the same occurrence. Rather than pursue service of a Taiwanese defendant, PIL and SD-X moved to voluntarily dismiss their action, which the district court granted on May 9, 2013. PIL and SD-X filed an answer in the present lawsuit on April 25, 2013. On September 17, 2013, Sonix filed a First Amended Complaint adding Herff Jones and Britannica as named Defendants.

The '845 patent, entitled "Method for Producing Indicators and Processing Apparatus and System Utilizing the Indicators," issued on February 12, 2008 and is directed to the use of graphical indicators (e.g., a matrix of small dots) affixed to the surface of an object and negligible to the human eye that provide information, beyond the visual text and images on the object's surface, that is retrievable through an electronic system. The '845 patent describes a method for producing visually negligible dot patterns – referred to as "graphical indicators" – affixed to a surface (e.g., the page of a book), that overlap and co-exist, but do not interfere, with the main information on the surface of the object (e.g., visual text and images). By the time Sonix filed this lawsuit in March 2013, the '845 patent had undergone two ex parte reexaminations before the United States Patent and Trademark Office ("PTO") – both resulting in the issuance of Ex Parte Reexamination Certificates on December 27, 2011 and December 26, 2012. The '845 patent was also subject to litigation that the parties settled and voluntarily dismissed in June 2011. *See Sonix Tech. Co., Ltd. v. VTech Elecs. N. Am., LLC*, 10 C 8291 (N.D. Ill. June 25, 2011).

Following the close of discovery in this lawsuit, Defendants filed a motion for summary judgment pursuant to Federal Rule of Civil Procedure 56(a) arguing that the '845 patent was invalid and non-infringed. The Court granted Defendants' summary judgment motion on the ground that the '845 patent was invalid for indefiniteness. Specifically, the Court concluded that the claim term "visually negligible" was subjective, that the claim language did not provide

guidance on its meaning, and that the written description did not provide a person of ordinary skill in the art “with a meaning that is reasonably certain and defines objective boundaries as to the scope of ‘visually negligible’ as used in the ‘845 Patent” – keeping in mind that because the parties agreed that the Court should give the term “visually negligible” its ordinary meaning, the Court did not construe “visually negligible” in its October 2014 claim construction ruling. In the December 2015 summary judgment ruling, the Court concluded that “visually negligible” rendered the asserted claims invalid as indefinite. Because the Court concluded that the ‘845 patent was invalid as indefinite, it did not address any infringement arguments at summary judgment.

Sonix then appealed to the United States Court of Appeals for the Federal Circuit. The Federal Circuit reversed the determination of indefiniteness and the judgment of invalidity on the ground that the term “visually negligible” was not indefinite. The Federal Circuit specifically concluded that the claim term “visually negligible” was not purely subjective because “the question of whether something is ‘visually negligible’ or whether it interferes with a user’s perception...involves what can be seen by the normal human eye.” *Sonix Tech. Co., Ltd v. Publications Int’l, Ltd.*, 844 F.3d 1370, 1378 (Fed. Cir. 2017). Further, the Federal Circuit concluded that although “visually negligible” is “a term of degree,” what “can be seen by the normal human eye” is an “objective baseline through which to interpret the claims.” *Id.* In sum, the Federal Circuit held “that ‘visually negligible’ is not a purely subjective term and that, on this record, the written description and prosecution history provide sufficient support to inform with reasonable certainty those skilled in the art of the scope of the invention.” *Id.* at 1381. Due to the Federal Circuit concluding that the asserted claims were not indefinite, it did not address Sonix’s alternative arguments for reversal.

## II. Dr. Amit Ashok's Qualifications

Dr. Ashok graduated from the University of Swaziland with a B.Sc. in Electronics and Telecommunication Engineering in 1998, and in 2001, he graduated from the University of Cape Town, South Africa with a M.S. in Electrical Engineering. In 2008, Dr. Ashok graduated from the University of Arizona with a Ph.D. in Electrical and Computer Engineering with a minor in Optical Sciences. While working on his Ph.D, Dr. Ashok was a graduate research assistant in the University of Arizona Department of Electrical and Computer Engineering Optical Computing and Processing Lab.

Thereafter, specifically, from 2007 to 2009, Dr. Ashok was a senior scientist in the New Applications and Research and Development Group at OmniVision CDM Optics Inc. In 2009, Dr. Ashok became a senior research scientist in the Optical Computing and Processing Lab at the University of Arizona. He began teaching at the University of Arizona in the Department of Electrical and Computer Engineering as an assistant professor and the College of Optical Science as an associate professor in 2011. Presently, Dr. Ashok directs the Intelligent Imaging and Sensing Lab at the University of Arizona. In addition, he has conducted research in the areas of image processing, optical engineering, computational imaging, partially-coherent compressive imaging, knowledge enhanced compressive measurement, post-measurement information theoretic compression, and compressive passive 3D imaging.

Furthermore, Dr. Ashok has published numerous scholarly journal and conference articles relating to sensing and imaging, including Yujie Gu, Nathan Goodman & Amit Ashok, *Compressed Sensing Kernel Design for Radar Range Profiling*, 62 IEEE Transactions on Signal Processing 3194 (2014); Amit Ashok, Liang C. Huang & Mark A. Neifeld, *Information Optimal Compressive Sensing: Static Measurement*, 30 JOSA A 831 (2013); Vicha Treeaporn, Amit

Ashok & Mark A. Neifeld, *Space-time Compressive Imaging*, 51 Applied Optics A67 (2012); B.M. Kaylor, Amit Ashok, *et al.*, *Dynamically Programmable, Dual-Band Computational Imaging System*, in Computational Optical Sensing and Imaging, OSA Technical Digest (2012); Amit Ashok & Mark A. Neifeld, *Compressive Imaging: Hybrid Measurement Basis Design*, 28 JOSA A 1041 (2011); and Jun Ke, Amit Ashok & Mark A. Neifeld, *Object reconstruction from adaptive compressive measurements in feature-specific imaging*, 49 Applied Optics H27 (2010). Dr. Ashok has numerous manuscripts in progress, including work with Roman Kerviche entitled “Joint-Design Approach for Extended Depth of Field Imaging,” and “Scalable Information-Optimal Imaging.” Also, Dr. Ashok is a journal reviewer for SPIE Journal: Optical Engineering; OSA Journals: JOSA A, Applied Optics, Optics Letters, Optics Express; and IEE Journals: Transactions on Image Processing, Signal Processing Letters.

Dr. Ashok has given numerous talks at conferences, including “Projective Imager Design with Task Specific Information” at Frontiers in Optics in 2007, “Multi-Domain Optimization for Ultra-Thin Cameras” at Frontiers in Optics in 2006, and “Engineering the Point-Spread-Function for Super-Resolution from Multiple Low-Resolution Sub-Pixel Shifted Frames” at Frontiers in Optics in 2005. He is named as an inventor on several publications and patents, namely, “Color imaging based on computations imaging and narrow band absorption color filter array,” “Object-based pre-processing for OCR,” and “Image Data Fusion Systems and Methods.” U.S. Patent Application Publication No. US 2016/0245698 (filed Apr. 6, 2016); U.S. Patent Application Publication No. US 2012/0063690 (filed Sep. 6, 2011); U.S. Patent No. 8,824,833 (filed Jan. 30, 2009).

## LEGAL STANDARD<sup>1</sup>

“In *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, the Supreme Court explained that Rule 702 requires the district court to serve in a gatekeeping role and make ‘a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid.’” *Haley v. Kolbe & Kolbe Millwork Co.*, 863 F.3d 600, 611 (7th Cir. 2017) (quoting *Daubert*, 509 U.S. at 592-93). In short, *Daubert* requires the district court to act as an evidentiary gatekeeper, ensuring that an expert’s testimony rests on a reliable foundation and is relevant to the task at hand.” *Krik v. Exxon Mobil Corp.*, \_\_\_ F.3d \_\_\_, 2017 WL 3768933, at \*3 (7th Cir. Aug. 31, 2017). Although the Seventh Circuit reviews “the district court’s application of *Daubert* [] de novo,” if “the court adhered to the *Daubert* framework, then its decision on admissibility is reviewed for abuse of discretion.” *Estate of Stuller v. United States*, 811 F.3d 890, 895 (7th Cir. 2016).

A district court’s evaluation of expert testimony under *Daubert* does not “take the place of the jury to decide ultimate issues of credibility and accuracy.” *Lapsley v. Xtek, Inc.*, 689 F.3d 802, 805 (7th Cir. 2012). Once it is determined that “the proposed expert testimony meets the *Daubert* threshold of relevance and reliability, the accuracy of the actual evidence is to be tested before the jury with the familiar tools of ‘vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof.’” *Id.* (quoting *Daubert*, 509 U.S. at 596). A district court’s inquiry under *Daubert* is a flexible one and district courts have wide latitude in performing this gate-keeping function. *See Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 141, 119 S.Ct. 1167, 143 L.Ed.2d 238 (1999); *see also Krik*, \_\_\_ F.3d \_\_\_, 2017 WL

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<sup>1</sup> “Whether proffered evidence is admissible at trial is a procedural issue not unique to patent law, and we therefore review the district court’s decision to admit expert testimony under the law of the regional circuit[.]” *Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1294 (Fed. Cir. 2015).

3768933, at \*3 (“The district court holds broad discretion in its gatekeeper function of determining the relevance and reliability of the expert opinion testimony.”). “[T]he key to the gate is not the ultimate correctness of the expert’s conclusions,” rather, “it is the soundness and care with which the expert arrived at her opinion[.]” *C.W. ex rel. Wood v. Textron, Inc.*, 807 F.3d 827, 834 (7th Cir. 2015) (citation omitted). “[T]he proponent of the evidence must establish that the expert’s testimony is reliable (and relevant) by a preponderance of the evidence.” *United States v. Saunders*, 826 F.3d 363, 368 (7th Cir. 2016).

## **ANALYSIS**

In Defendants’ *Daubert* motion, they seek to exclude certain portions of Dr. Ashok’s expert opinion testimony for three reasons: (1) in applying the claim term “visually negligible” in his infringement and validity analyses, Dr. Ashok utilized an improper subjective standard; (2) Dr. Ashok used an unjustified assumption to extend the analysis he performed on a few accused products to all fifty-three accused products relevant in this lawsuit; and (3) when Dr. Ashok applied the term “header information,” he added new limitations and requirements that were not in the Court’s claim construction.

### **I. Visually Negligible Opinions**

Dr. Ashok has offered expert opinions relating to the limitation “visually negligible” in the context of both the accused products’ alleged infringement and the alleged invalidity of the ‘845 patent based on certain prior art references. In his May 5, 2015 Opening Expert Report relating to infringement, Dr. Ashok opined:

The dot patterns printed on the Accused Products are visually perceptible to a degree if one views the printed material very carefully at close distance in the proper lighting, but they do not interfere at all with the user’s perception of the text and images on the surface. A typical user is unlikely to even notice and would not pay attention to these background patterns on the pages of the various books and globes in question when they are viewing the text and images. Thus, it

is my opinion that the dot patterns printed on all of the Accused Products satisfy the claim requirement that they be “visually negligible.”

(R. 279-1, 5/5/15 Ashok Report, at 19.)

Defendants move to exclude portions of Dr. Ashok’s testimony regarding the term “visually negligible” arguing that his opinions do not fulfill the *Daubert* standard for reliability and relevance. *See Daubert*, 509 U.S. at 597 (district court must ensure that expert evidence “both rests on a reliable foundation and is relevant to the task at hand.”). More specifically, Defendants argue that Dr. Ashok utilized an improper subjective standard in light of the Federal Circuit’s ruling that “visually negligible” is an objective term. As discussed above, the Federal Circuit held “that ‘visually negligible’ is not a purely subjective term” and that what “can be seen by the normal human eye” is an “objective baseline through which to interpret the claims.” *Sonix*, 844 F.3d at 1378, 1381. Thus, the premise of Defendants’ argument that “visually negligent” is an objective term misstates the Federal Circuit’s ruling. With this in mind, the Court first turns to Defendants’ argument that Dr. Ashok’s expert opinions as to the term “visually negligible” are scientifically unreliable. *See United States v. Smith*, 811 F.3d 907, 909 (7th Cir. 2016) (expert opinion must be based on “scientific, technical, or other specialized knowledge”) (quoting Fed.R.Evid. 702).

**A. Dr. Ashok’s Infringement Opinions**

Defendants specifically argue that Dr. Ashok’s “visually negligible” infringement opinion is speculative and that because Dr. Ashok did not apply any scientific method in forming his opinion, his conclusions are mere ipse dixit. *See General Elec. Co. v. Joiner*, 522 U.S. 136, 146, 118 S.Ct. 512, 139 L.Ed.2d 508 (1997) (“A court may conclude that there is simply too great an analytical gap between the data and the opinion proffered.”). Under *Daubert*, a “critical inquiry is whether there is a connection between the data employed and the opinion offered; it is



the opinion connected to existing data ‘only by the *ipse dixit* of the expert,’ that is properly excluded under Rule 702.” *Manpower, Inc. v. Ins. Co. of Penn.*, 732 F.3d 796, 806 (7th Cir. 2013) (quotation omitted); *see also Brown v. Burlington N. Santa Fe Ry. Co.*, 765 F.3d 765, 772 (7th Cir. 2014) (“Rule 703 requires the expert to rely on “facts or data,” as opposed to subjective impressions.”).

In support of their argument that Dr. Ashok did not base his visually negligible infringement opinions on a reliable methodology, Defendants point to Dr. Ashok’s deposition testimony in which counsel questioned him about the method he used in determining “visual negligibility” as to the accused products:

Question: Again, if I wanted to know whether or not my dots were visually negligible under the ‘845 patent, is there any sort of standard that you could point me to that would say it’s visually negligible at this point?

Answer: I would say that – I would refer to the example densities which are mentioned in the patent. That would be one such recommendation. But it is not a universal standard by any means because it depends on the visual acuity of the observer. And my method of determining visual negligibility would be print at the magnification desired and look at it. I would imagine that would be representative of most people looking at it. But there is no technical standard that I know of which would say this becomes visually negligible at this point.

(R. 279-3, 07/15/15 Ashok Dep. at 51.)

In making their argument, however, Defendants ignore the Federal Circuit’s ruling on appeal. In particular, after concluding that “visually negligible” is “a term of degree,” and that what “can be seen by the normal human eye” is an “objective baseline through which to interpret the claims,” the Federal Circuit considered intrinsic and extrinsic evidence to further support its holding that the term “visually negligible” was not indefinite. *See Sonix*, 844 F.3d at 1378-80 (“[c]laim language employing terms of degree has long been found definite where it provided enough certainty to one of skill in the art when read in the context of the invention.”) (citation

omitted); *see also Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014) (“we hold that a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.”). In doing so, the Federal Circuit discussed Defendants’ arguments concerning Dr. Ashok’s deposition testimony:

Appellees repeatedly cite Dr. Ashok’s responses during his deposition. Appellees asked Dr. Ashok to define “visually negligible,” a term for which he had given no previous definition, and which Appellees had previously agreed did not need a construction. But it is unsurprising that Dr. Ashok indicated that he was unaware of a “technical standard” for the term, as Appellees had agreed to an ordinary-meaning construction, there was no reason for him to attempt to determine one. Even so, Dr. Ashok did not opine that a skilled artisan would have any trouble understanding the term or that the claims were indefinite, and he observed that he thought that his assessment of what was visually negligible would likely be representative.

*Id.* at 1380 (internal record citations omitted).

Not only do the Federal Circuit’s observations regarding Dr. Ashok’s deposition testimony explain why Dr. Ashok did not determine a technical standard for the term “visually negligible,” but the appellate court’s opinion speaks to why Dr. Ashok’s opinion testimony that the accused products satisfy the claim requirement that they be “visually negligible” may be unnecessary. *See Daubert*, 509 U.S. at 591 (Rule 702 “requires that the evidence or testimony ‘assist the trier of fact to understand the evidence or to determine a fact in issue,’” which “goes primarily to relevance.”). In particular, the Federal Circuit reasoned:

Appellees apparently understood the meaning of “visually negligible” from the beginning of the litigation. Their initial invalidity contentions did not argue that the “visually negligible” was indefinite, and neither did their final contentions. Indeed, at no point before Dr. Ashok’s deposition did they contend that “visually negligible” was indefinite, even though they contended that twenty-eight other terms *were* indefinite. That Appellees themselves did not question the clarity of “visually negligible” in the first several years of litigation supports the conclusion that the term could be understood with reasonable certainty.

*Id.* (emphasis in original).

Equally important – prior to their *Daubert* reply brief dated July 27, 2017 in which they state for the first time that their view of the term “visually negligible” has changed – Defendants did not dispute that the dot patterns in all of the accused products are “visually negligible” in the district court litigation. In Defendants’ response to Sonix’s final infringement contentions, for example, “Defendants admit that the dots printed in the Identified Product(s) are visually negligible, and therefore would fall within the literal scope of that requirement in this claim element.”<sup>2</sup> (R. 293-1, Ex. 1, 2/25/15 Resp. to Sonix Final Infringement Contentions, Attachments A, B.) In addition, Defendants PIL’s and SDX’s Rule 30(b)(6) witness testified that the dot patterns in the accused products are “meant to be transparent to the user[.]” (R. 293-1, Ex. 2, Coyle Dep., at 115:12-13.) Indeed, Defendants’ own expert, Dr. Daniel Engels, stated in his rebuttal report that “I agree with the analysis of Dr. Ashok [that] the dot patterns in the specific products reviewed by Dr. Ashok in his Report are visually negligible and affixed to the surface of an object.” (R. 184-6, Engels Rep. ¶ 144.) Accordingly, the Court, in its discretion, denies this aspect of Defendants’ *Daubert* motion.<sup>3</sup>

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<sup>2</sup> Defendants cannot amend their responses to Sonix’s final infringement contentions via their *Daubert* reply brief. See N.D.Ill. L.P.R. 3.4. Moreover, any such amendment at this late date in the proceedings – with a trial date set for February 5, 2018 – would be unfairly prejudicial. See *Freed v. Friedman*, 215 F. Supp. 3d 642, 658 (N.D. Ill. 2016) (district court has inherent authority to “control the disposition of the causes on its docket with economy of time and effort for itself, for counsel, and for litigants.”) (citation omitted).

<sup>3</sup> Defendants do not develop their argument that the Court should bar Dr. Ashok’s testimony in relation to the Accused Products that he did not test. Instead, Defendants cite an Eighth Circuit case that is distinguishable on the facts. See *Dancy v. Hyster Co.*, 127 F.3d 649, 652 (8th Cir. 1997) (“there are significant differences between these two pieces of lifting equipment and lift trucks: differences that prevent the automatic assumption that what works on one will work on another.”); see also *Native Am. Arts, Inc. v. Peter Stone Co., U.S.A.*, 222 F. Supp. 3d 643, 648 (N.D. Ill. 2016) (“That rejection by a judge in one case does not mean that in another case, the expert cannot testify follows from the principle that a district court’s decision to admit or bar expert evidence is a matter of discretion.”). Defendants’ undeveloped arguments are waived.

## **B. Dr. Ashok's Validity Opinions**

The Court now turns to Dr. Ashok's "visually negligible" opinions in relation to the alleged invalidity of the '845 patent based on certain prior art references. To give context, as early as early as January 17, 2014, Sonix disputed Defendants' invalidity contentions based on prior art in relation to the term "visually negligible." (R. 213-5, Resp. to Initial Invalidity Contentions.) Meanwhile, as stated in their Final Invalidity Contentions:

Defendants contend that the asserted claims of the '845 Patent are invalid as anticipated or obvious over one or more of the following prior art references, either alone or in combination with one another. These patents and publications are prior art because each of them constitutes prior art under 35 U.S.C. § 101, *et seq.*, and have a relevant filing, publication, or issue date prior to the claimed priority date of the '845 Patent, which Sonix asserts is no earlier than January 11, 2002.

(R. 213-6, Final Invalidity Contentions, at 3.) Defendants then identified numerous prior art references in support of their invalidity contentions. In his Rebuttal Expert Report, Dr. Ashok provided opinions regarding certain prior art references identified by Defendants, including U.S. Pat. No. 5,416,312 to Lamoure ("Lamoure"), U.S. Pat. No. 6,438,251 to Yamaguchi ("Yamaguchi"), U.S. Pat. No. 5,329,107 to Priddy ("Priddy"), U.S. Pat. No. 5,591,956 to Longacre ("Longacre"), and U.S. Pat. No. 4,924,078 to Sant' Anselmo ("Sant' Anselmo"). (R. 279-2, 6/1/15 Rebuttal Report.)

In the present motion, Defendants contend that Dr. Ashok's prior art opinions regarding the term visually negligible "suffer from the same flaws as his infringement opinions." In making this argument, Defendants fail to acknowledge that Dr. Ashok's validity opinions relate to whether certain prior art references disclose the concept of "visually negligible" graphical

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*See M.G. Skinner & Assocs. Ins. Agency, Inc. v. Norman-Spencer Agency, Inc.*, 845 F.3d 313, 321 (7th Cir. 2017) ("Perfunctory and undeveloped arguments are waived, as are arguments unsupported by legal authority.").

indicators. In other words, Dr. Ashok's prior art analysis was not based on his own observations of exemplary dot patterns, but rather he based his opinions on the express disclosures in the prior art references as he understood them based on his background, training, and experience in electrical engineering and optical physics. That being said, Dr. Ashok's understanding of "visually negligible" speaks to his ability to differentiate the claimed invention from prior art.

Turning to Defendants' specific arguments, they first assert that Dr. Ashok did not give a reasoned basis that the Priddy, Longacre, and Sant' Anselmo references were not intended to be visually negligible and that the dot patterns disclosed in Priddy would not be visually negligible in the first instance. Despite Defendants' argument to the contrary, Dr. Ashok gave detailed explanations for the basis of his opinions in his Rebuttal Report and during his deposition as to these prior art references. More specifically, in discussing the Priddy reference, Dr. Ashok opined:

The Priddy reference is entitled Dynamically Variable Machine Readable Binary Code and Method for Reading and Producing Thereof. The fundamental concept disclosed in Priddy is a two-dimensional machine-readable binary code that can be scaled in size, format and density of information. An enabling feature of this binary code design is the concept of "matrix perimeter[.]"

It is important to point out that while this feature, i.e. the matrix perimeter or border, of the binary code embeds orientation information, such a binary code represents a solution to a design problem that is fundamentally different than that addressed by the '845 patent. The binary codes disclosed in Priddy are not intended to be and are not visually negligible. In fact, it is essential that they be highly visible to the user so that they can be visually located and scanned[.]

Because it must be easily visually identifiable, the binary code disclosed in Priddy is not designed to be *visually negligible*, a requirement for overlaying binary codes without interfering with main information. There are two primary design elements of the binary code disclosed in Priddy that render it visually nonnegligible: (1) the size of the dots or equivalently high (~100%) fill factor, and (2) the dense nature of the code (particularly the contiguous line on the perimeter).

In fact, if such a code is repeated and printed even at microscopic scale (i.e. with features on the scale of tens of microns) in a periodic or a semi-periodic manner, it would be visually significant. I have reviewed the affidavit of Sejer Sejersen filed with the U.S. Patent and Trademark Office in connection with one of the reexamination proceedings relating to the '845 patent. Mr. Sejersen prepared six exemplary dot pattern samples based on the disclosures of the '845 patent, the Priddy reference, and the Lamoure reference. These exemplars establish that the matrix perimeter lines of Priddy as well as the checkerboard pattern disclosed in Lamoure result in highly distracting patterns that would materially interfere with the viewer's perception of any text or images on the surface[.]

This highlights two common design features (and limitations) of this and other such two-dimensional binary code or data matrix code designs in general. First, the main motivation driving design of codes such as those disclosed in Priddy is to offer a scalable method for encoding a high density of information at the macro level in a code that is easily visually identifiable. Second, there is no requirement to distinguish such binary codes from adjacent ones. In applications where the goal is to provide additional information about main information on a surface (text and images) on a surface by overlaying binary code such as a dot pattern, these two design features become major limitations. In such applications, the binary codes must be: (a) visually negligible so as not to interfere with overlapping main information, (b) distinguishable from adjacent binary codes, and (c) able to be read from any orientation.

Thus, Priddy does not teach a binary code that is visually negligible *and* includes header information capable of distinguishing it from adjacent codes and capable of determining orientation. In my opinion, it would not be obvious to a person of ordinary skill in the art to extend the matrix perimeter concept disclosed in Priddy to the graphical indicator concept disclosed and claimed in the '845 patent.

(Rebuttal Rep., at 16-18.) (emphasis in original). At his deposition, Dr. Ashok explained that he relied upon testing done by Sonix's printing expert as to the irritability or visual non-negligibility of certain patterns in forming his opinions. (Ashok Dep. at 111-12.) Also, Dr. Ashok meticulously walked counsel through his Priddy analysis. (*Id.* at 135-36.)

Similarly, Dr. Ashok's analyses of the Longacre and Sant' Anselmo references sufficiently substantiate his conclusions, especially in the context of Dr. Ashok's entire Rebuttal Report. In his analysis of the Longacre reference, Dr. Ashok explained:

The data encoding structure disclosed in Longacre can be viewed as a further evolution of the data matrix codes (e.g. the codes disclosed in Priddy) to increase the information density and improve handling of distortions, while lowering processing time and increasing read accuracy at reasonable costs. The data matrix design in Longacre, however, like Priddy, was designed to be visually identifiable. In particular, the finder structure design element of the data matrix contributes to increased visibility that is not acceptable for applications where the data matrix or dot pattern need to be visually negligible, particularly when arranged in a semi-periodic or periodic manner at high spatial density and microscopic scale (i.e. with features on the scale of tens of microns).

(*Id.* at 20-21). In discussing the Sant’ Anselmo reference, Dr. Ashok clarified:

All the variations of the border disclosed in the Sant’ Anselmo reference suffer from the same limitations as data matrix codes in general, which is not being visually negligible. The size and the fill factor of the data cells used to encode information in the data matrix codes disclosed in Sant’ Anselmo further renders them not visually negligible. As a result, the variation of data matrix design in Sant’ Anselmo again relies on a *visually significant* border structure that is inappropriate where the dot pattern needs to be overlaid with text and/or images without visually interfering with such main information.

(*Id.* at 22-23) (emphasis in original). At his deposition, Dr. Ashok testified why – from a usability perspective – it is important that a pattern be noticeable when discussing the Sant’ Anselmo reference:

[T]ypically because these dot matrix codes appear on products, they are pasted or printed on products to identify ... serial number[s] or different information. And typically, a human operator points their optical gun or camera to that particular location.... [F]or example, in a grocery store...the cashier would want to know where the bar code is located.”

(Ashok Dep., at 114-15.)

Despite Dr. Ashok’s comprehensive explanations, Defendants contend that Dr. Ashok did not explain how certain factors affected visual negligibility in the prior art. Instead of fleshing out this argument, Defendants drop a footnote stating that Dr. Ashok did not identify or explain how size of dots, fill factor, density, spacing, homogeneity, or non-isotropy of codes affect the visual negligibility of dot patterns. Defendants’ undeveloped argument is waived. *See*

*Evergreen Square of Cudahy v. Wisconsin Hous. & Econ. Dev. Auth.*, 848 F.3d 822, 829 (7th Cir. 2017) (“A party may waive an argument by presenting it only in an undeveloped footnote.”). Further, Defendants may test Dr. Ashok’s reliance on these factors at trial through “vigorous cross-examination.” *See Daubert*, 509 U.S. at 596.

Finally, Defendants’ argument that Dr. Ashok is not qualified to testify about “dot-pattern technology” because his curriculum vitae fails to show experience working with any such technology overlooks Dr. Ashok’s extensive training, experience, and education in optical physics and electrical engineering. *See Fed.R.Evid. 702* (An expert may be qualified “by knowledge, skill, experience, training or education.”); *Smith v. Ford Motor Co.*, 215 F.3d 713, 718 (7th Cir. 2000) (courts “should consider a proposed expert’s full range of practical experience as well as academic or technical training when determining whether that expert is qualified to render an opinion in a given area.”). In fact, Defendants admit that Dr. Ashok is “well qualified in the areas of electrical engineering and optical physics.” (R. 279, Opening Brief, at 6.) Moreover, Defendants’ attempt to carve out a narrow “dot pattern technology” expertise from Dr. Ashok’s broader expertise and multi-disciplinary research in optical engineering is misplaced, especially in light of Dr. Ashok’s deposition testimony explaining how his expertise and technical knowledge is relevant to understanding his ability to differentiate the claimed invention from prior art. Therefore, the Court, in its discretion, denies Defendants’ *Daubert* motion as to Dr. Ashok’s expert opinions regarding the term “visually negligible” in the context of the prior art references.

## **II. Claim Term – “Header Information”**

As discussed immediately above, Dr. Ashok has offered expert opinions distinguishing prior art references in relation to Defendants’ invalidity defenses. In this vein, in their opening



brief, Defendants make a cursory, two-paragraph argument that Dr. Ashok added improper limitations to the term “header information” during his deposition, and thus the Court should strike his opinions as to that term. *See Exergen Corp. v. Wal-Mart Stores, Inc.*, 575 F.3d 1312, 1321 (Fed. Cir. 2009) (“No party may contradict the court’s construction to a jury”). In their reply brief, Defendants further argue that Dr. Ashok and Sonix are “importing unstated limitations into the Court’s constructions for ‘header information’” in an attempt to avoid the teachings of the Lamoure prior art reference (Pat. No. 5,416,312 to Lamoure). On the other hand, Plaintiff maintains that the challenged deposition testimony is Dr. Ashok’s description of the distinctions between the ‘845 patent and the Lamoure reference.

Turning the Court’s claim construction relevant to Defendants’ argument, after the September 2014 *Markman* hearing, the Court construed “header information” to mean “information in the graphical indicator that is used to retrieve the graphical indicator and corresponding content information and is capable of (1) distinguishing the corresponding graphical indicator from an adjacent graphical indicator, and (2) indicating the orientation of the corresponding graphical indicator to the optical device.” *Sonix Tech. Co. Ltd. v. Pub’ns Int’l Ltd.*, 2014 WL 5489353, at \*29 (N.D. Ill. 2014). In both his Opening and Rebuttal Reports, Dr. Ashok acknowledged the Court’s construction of “header information” as follows:

I understand the Court has construed the claim term “header information” to mean “information in the graphical indicator that is used to retrieve the graphical indicator and corresponding content information and is capable of (1) distinguishing the corresponding graphical indicator from an adjacent graphical indicator, and (2) indicating the orientation of the corresponding graphical indicator to the optical device.”

(*See, e.g.*, Opening Report, at 22.) Furthermore, Dr. Ashok states in both of his expert reports that: “I understand that the Court has construed certain terms used in the patent claims and I

have applied the Court's constructions as set forth in its Claim Construction Order dated October 30, 2014 in formulating my opinions." (*Id.* at 2.)

To lend further guidance to Defendants' arguments, Dr. Ashok's opinions in his Rebuttal Report concerning the Lamoure reference state:

The Lamoure reference was disclosed to the U.S. Patent Office by Sonix during the original prosecution of the '845 patent, and thus is cited prior art that was considered during the original examination that led to issuance of the '845 patent. The Lamoure reference has also been the basis for two reexamination proceedings, both of which have confirmed the patentability of the asserted claims over the Lamoure reference.

The Lamoure reference attempts to solve the problem of how to associate large quantities of diverse information with the limited amount of visual information that can be effectively presented to a user on a map. Lamoure teaches the use of dot patterns that it refers to as "indexes" printed on a "sheet" such as a map to essentially hyperlink points on the sheet to large quantities of related information. Using this system, a Lamoure index "serves as a key giving access to information that is not provided on the document, and which may differ according to the intended use thereof and can be easily updated." This would allow entire texts to be stored in a database. By selection of a particular index on the surface of the map, the user could further consult the database "using an input means such as a keyboard, and an alphanumeric display means" to obtain the specific information the user desired.

The "indexes" disclosed in Lamoure are dots arranged in block patterns that could be read by an optical wand. However, the "indexes" disclosed in Lamoure lack key features of the graphical indicators claimed in the '845 patent.

For example, Lamoure recognized the problem of differentiating between closely spaced "indexes" on a sheet. To address this problem, Lamoure teaches a single solution for differentiating among "indexes" that is based on spacing:

To facilitate further the identification and decoding of the pattern best centered in the scanning field of the optical reading means, it is possible to incorporate in the frame only one block out of two and to arrange the incorporated blocks after the fashion of a regular rectangular checkerboard, as shown in Fig. 4.

Recognizing the limitations of such a system, Lamoure speculates that one could index the "blocks" using another indexing scheme that is also based on spacing such as "Hilbert's curve," but Lamoure does not develop such an approach. Lamoure failed to conceive of using a header portion incorporated into his

“indexes” instead of mandatory spacing between indexes to differentiate among multiple indexes in the field of view of the optical reader.

Lamoure similarly recognizes the problem of determining the orientation of an “index” relative to the optical reader. However, Lamoure again turns to spacing and the use of a coordinate arrangement of “indexes” to solve this problem. Arranging the “indexes” in a “checkerboard pattern,” Lamoure teaches that such a checkerboard arrangement “defines the two orthogonal directions, x, y.” Such an orthogonal system “enabl[es] the map to be oriented about the index in question,” thus facilitating identification of the indexes.

Thus, while recognizing issues relating to differentiation and orientation of the “indexes” that make up the encoding units disclosed in the Lamoure reference, the only solution to these issues that is contemplated by Lamoure is mandatory spacing between the “indexes.” Lamoure does not disclose header portions incorporated into the “indexes” to differentiate among or determine the orientation of the “indexes” in the field of view of the optical reader. As a result, the concept disclosed in Lamoure is limited to an orthogonal arrangement of spaced apart “indexes” on the surface of a map.

(Rebuttal Rep., at 11-13.) (internal citations omitted). Dr. Ashok further opined:

Lamoure fails to disclose a graphical indicator as claimed in the Asserted Claims of the ‘845 patent. A graphical indicator can take any regular or irregular shape and may have *any* orientation on the surface. A graphical indicator also includes header information that may serve a variety of functions, including differentiation among graphical indicators and establishment of orientation relative to the optical reader.

[L]amoure’s indexes are not graphical indicators because Lamoure does not teach the use of headers, and because Lamoure’s indexes could only be used in a *specific orientation* relative to the surface or the optical reader. The graphical indicator of the ‘845 patent overcomes major limitations in the indexes of Lamoure, solving problems that Lamoure recognized but failed to effectively address.

(*Id.* at 23.) (emphasis in original) (internal citation omitted).

At his deposition, Dr. Ashok distinguished the Lamoure reference from the ‘845 patent as follows:

Question: You had said then, that it doesn’t include a header. Is that because of the visual negligibility issue that you talked about?

Answer: So two issues, visual negligibility and also the limitations. *I think the '845 definition of "header" does not have any limitations in terms of which orientations which it can distinguish, which it cannot.* But the Lamoure does have that limitation. So those are the two distinctions.

Question: Anything else with respect to that issue?

Answer: So more of a finer detail. From my understanding of the '845 patent, *I think the intention of the header is to be a somewhat well-defined local pattern that allows determination of the orientation and the boundaries of the graphic indicator.*

As opposed to Lamoure – you know it has similar functionalities of the header with those limitations and caveats I mentioned, but it is not – *it is a distributed kind of restriction on the patterns of dots, which manifests itself as a header.*

So for example, those spaces. So the absence of those dots and those spaces is one aspect of the header, right? The other aspect is the absence of the dots and the rows and columns, the checkerboard pattern. So all of those things combined give it that functionality of limited orientation and distinguishability.

And I believe the '845 patent does not intend that header to be necessarily distributed with, you know, the examples which are specified. It is more – in a more localized sense. That is a very fine distinction.

*(Id.* at 138-40) (emphasis added).

Defendants first argue that Dr. Ashok added a new requirement to the term “header information,” namely, that the dot pattern must “not have any limitations in terms of which orientations which it can distinguish, which it cannot.” In response, Plaintiff explains that Dr. Ashok’s statements about the disclosures in the Lamoure reference do not add new limitations to “header information,” but rather his testimony describes the distinctions between the '845 patent and the Lamoure reference. The Court agrees. More specifically, the Court’s construction requires “header information” to be capable of “indicating the orientation of the corresponding graphical indicator to the optical device.” In his Rebuttal Report, Dr. Ashok clarified “Lamoure fails to disclose a graphical indicator as claimed in the Asserted Claims of the '845 patent”

because a “graphical indicator can take any regular or irregular shape and may have *any* orientation on the surface” and “Lamoure’s indexes could only be used in a *specific orientation* relative to the surface or the optical reader.” Dr. Ashok’s testimony that “header information” in the ‘845 patent does not place any limitations on which orientations the header can indicate distinguishes the Lamoure reference’s shortcomings in that the dot pattern (“indexes”) disclosed can only indicate orientation in certain circumstances.

Defendants also assert that Dr. Ashok’s testimony adds the requirement that the header information must “be a somewhat well-defined local pattern” as opposed to a “distributed kind of restriction on the patterns of dots.” As Dr. Ashok explained when making these comments, he was drawing a very fine distinction between Lamoure and the ‘845 patent – but he also admitted that the “concept of a localized header or localized header information” was from his own understanding, not the Court’s claim construction. (Ashok Dep., at 140.) In this respect, Dr. Ashok’s testimony contradicts the Court’s claim construction, and thus would not be helpful to the jury. *See Rodefer v. Hill’s Pet Nutrition, Inc.*, No. IP 01–123–C H/K, 2003 WL 23096486, at \*5 (S.D. Ind. 2003) (Hamilton, J.) (“Evidence is relevant under *Daubert* if it is ‘helpful’ to the trier of fact and ‘fits’ the issues in the case.”). The Court, in its discretion, grants Defendants’ *Daubert* motion in this respect.

Further, Defendants argue that Dr. Ashok’s deposition testimony adds to the Court’s construction of “header information” by requiring that “the same information be used to perform each of the functions in the Court’s construction.” Defendants point to the following deposition testimony in support of their argument:

Answer: So in Lamoure, this functionality is split into two parts. For distinguishability, you have to rely on the white spaces. But for orientation, you have to rely on this – the gaps in the rows and columns, the white spaces, the white rows and columns.

So in '845, the header, which is both of those requirements simultaneously, it seems here you need two different structures in Lamoure to achieve each one of those requirements.

Question: So – I want to make sure I understand. It is your understanding that the term “*header information*” as construed by the Court requires the same information to be used for both *distinguishing* and *orienting*?

Answer: Yes.

Question: Can it reference other information other than the header?

Answer: It is not limited to those functionalities. I can embed other information into the header.

Question: What I mean is, what if the information you have identified as the header information cannot by itself determine orientation or cannot by itself determine – distinguish between adjacent graphical indicators? Would that be header information, by your understanding?

Answer: That would cease to be a header information as intended by '845. *It requires at least those two functionalities.*

Question: And you believe, then, both of those functionalities have to be performed and have the same information.

Answer: Yes

(Ashok Dep., at 141-43) (emphasis added).

In response, Plaintiff argues that the dual functionality requirement applied by Dr. Ashok is consistent with the Court’s claim construction of the term “header information” because the Court’s construction of “header information” defines this term as “information in the graphical indicator that is...capable of (1) *distinguishing* the corresponding graphical indicator from an adjacent graphical indicator, and (2) *indicating the orientation* of the corresponding graphical indicator to the optical device.” Indeed, Ashok applied reasoning consistent with this Court’s construction because this term only refers to “information in the graphical indicator,” so it is

necessarily true that the same information is used for the functionality following in the definition.

Next, Defendants argue that Dr. Ashok's deposition testimony adds new limitations in the context of the Court's construction that header information is capable of "distinguishing the corresponding graphical indicator from an adjacent graphical indicator." In his Rebuttal Report, Dr. Ashok opined:

[Lamoure depends] on both an x-y coordinate arrangement and mandatory spacing between "indexes" such as in the checkerboard pattern arrangement of indexes shown in Figure 4. Such a checkerboard pattern does not result in "adjacent" indexes; rather the indexes each have mandatory spacing on all four sides to allow them to be distinguished from each other. The headers of the '845 patent eliminate the need for such mandatory spacing, allowing graphical indicators to be positioned adjacent to each other on all sides, as illustrated in the various figures in the '845 patent.

(Rebuttal Report, at 32.) In making their argument, Defendants point to Dr. Ashok's deposition testimony as follows:

Question: Now, on Page 32 of your report, you reference Figure 4. About midway down the first full paragraph or the second paragraph on the page, you say, "Such a checkerboard pattern does not result in," quote, "adjacent indexes. Rather, the indexes each have mandatory spacing on all four sides to allow them to be distinguished from each other." Do you see that?

Answer: Yes.

Question: So what meaning are you giving "adjacent" in this context?

...

Answer: Okay. So the question regarding the meaning of the adjacent is, if I look a dot pattern as, say, disclosed in Lamoure, there is a mandatory spacing required between those dot patterns, which are a collection of these black dots. So that spacing prevents two dot codes to be adjacent, which is basically the finish of one dot code and then the starting of the second dot code. There is this empty space which is, in my understanding, not a dot code, which is required. And that separates it. And that is the lack of adjacency in that sense. So adjacency here, I'm implying immediately juxtaposition.

(Ashok Dep., at 150.)

Specifically, Defendants contend that this testimony adds the requirement “that there cannot be ‘mandatory spacing’ used in the dot pattern” to the term “header information” as construed by the Court. In making this argument, Defendants misstate Dr. Ashok’s testimony because he was describing Figure 4 of the Lamoure reference when he directed counsel’s attention to Figure 4 explaining that it had “mandatory spacing on all four sides to allow them to be distinguished from each other.” In sum, Dr. Ashok’s testimony regarding the mandatory spacing in Lamoure reiterates his Rebuttal Report opinion where he distinguishes the Lamoure checkerboard pattern arrangement of indexes in Figure 4.

Last, Defendants maintain that Dr. Ashok’s testimony adds a limitation to the Court’s construction requiring “header information” to be capable of “distinguishing the corresponding graphical indicator from an adjacent graphical indicator.” In particular, Defendants state that Dr. Ashok’s deposition testimony adds the limitation “‘adjacent’ dot patterns require the dot patterns to be entirely surrounded by other dot patterns.” In support of this argument, Defendants merely point to a snippet of Dr. Ashok’s testimony and fail to give context to their argument. Without more, the Court cannot untangle Defendants’ argument to examine it under the *Daubert* rubric.

On a final note, Defendants point to the inconsistencies in Dr. Ashok’s testimony in relation to “header information” in the context of his infringement testimony and his testimony concerning the prior art references. That Dr. Ashok may have contradicted himself is not a proper challenge under *Daubert*. See *Lapsley*, 689 F.3d at 805 (District court’s evaluation of expert testimony under *Daubert* does not “take the place of the jury to decide ultimate issues of credibility and accuracy.”). Instead, Defendants may explore these alleged contradictions at trial.

Therefore, the Court, in its discretion, grants in part and denies in part Defendants’



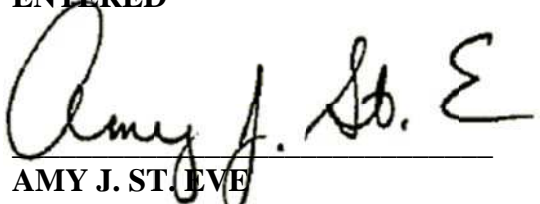
*Daubert* motion in relation to Dr. Ashok’s expert opinions regarding the term “header information.”

**CONCLUSION**

The Court, in its discretion, grants in limited part and denies in part Defendants’ motion to bar certain portions of Plaintiff’s expert witness Dr. Ashok brought pursuant to the Federal Rules of Evidence and *Daubert*.

**DATED:** October 2, 2017

**ENTERED**

  
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**AMY J. ST. EVE**  
**United States District Court Judge**