

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

|                                |   |                       |
|--------------------------------|---|-----------------------|
| SHURE, INC.,                   | ) |                       |
|                                | ) |                       |
| Plaintiff, Counter-Defendant,  | ) | No. 17 C 3078         |
|                                | ) |                       |
| v.                             | ) |                       |
|                                | ) | Judge Edmond E. Chang |
| CLEARONE, INC.,                | ) |                       |
|                                | ) |                       |
| Defendant / Counter-Plaintiff. | ) |                       |

**MEMORANDUM OPINION AND ORDER**

ClearOne alleges that Shure’s MXA910 audio-conferencing product infringes, among other patents, U.S. Patent No. 9,635,186. In March 2018, ClearOne lost its motion to preliminarily enjoin Shure’s sales of the MXA910. R. 278, Memo Op. and Order.<sup>1</sup> The key flaw in ClearOne’s motion was that, in the Court’s view, Shure had raised a substantial question on the patent’s validity. *Id.* at 27-37. Then, in January 2019, the Patent Trial and Appeal Board (PTAB) issued a final decision specifically holding that one of the same prior-art references on which this Court denied the preliminary injunction did *not* invalidate a related ClearOne patent, U.S. Patent No. 9,264,553. R. 478-1, PTAB Final IPR Decision at 19-29. ClearOne now moves for reconsideration of the preliminary-injunction denial in light of the PTAB’s January 2019 decision. R. 481, Mot. Reconsider. For the reasons explained below, the motion to reconsider is denied. This Opinion assumes familiarity with the Court’s previous preliminary injunction decision on the ’186 Patent, R. 278.

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<sup>1</sup>Citations to the record filings are “R.” followed by the docket number and, when necessary, a page or paragraph number.

## **I. Background**

### **A. '186 Patent**

The core contribution of the U.S. Patent No. 9,635,186 (the '186 Patent) is a method of efficiently combining beamforming (a technology that combines signals from multiple microphones to generate a combined audio signal that picks up sounds from a particular location) with acoustic echo cancellation (known the industry as AEC), which is a technology that removes far-end echo from an audio-conferencing system. Memo Op. and Order at 3. The Court previously described the '186 Patent in its preliminary-injunction decision:

Figuring out how to combine beamforming and acoustic echo cancellation in a cost-efficient way—while still preserving audio quality—has been a longstanding challenge in the audio industry. ...The illustrative claim of the '186 patent (Claim 7) discloses an efficient method of combining a beamforming microphone with AEC. The claimed method reduces AEC processing costs by providing a beamformer capable of picking up a number of audio signals, which are then combined into a smaller number of “fixed” beams. AEC is then performed on only the smaller number of fixed beams. Performing AEC on fixed (as opposed to adjustable) beams reduces the amount of work for the acoustic echo cancellers, which would otherwise need to constantly adjust to track the changing beams. After AEC is performed, a “signal selection module” selects one or more of the echo-cancelled signals to transmit to the far end. The signal selection module also uses the far-end signal as information to inhibit the change of the near-end signal selection while only the far-end signal is “active.”

*Id.* at 4 (internal citations omitted).

### **B. Prior Decision**

In August 2017, ClearOne moved for a preliminary injunction to halt Shure's production and sale of the MXA910, a ceiling-mounted microphone that ClearOne alleges infringes the '186 Patent. R. 81, Mot. Prelim. Inj. The Court heard evidence

on the motion in February 2018, and in March 2018 denied it. Memo Op. and Order. The Opinion found that ClearOne had met some of the requirements: ClearOne was likely to succeed in proving that Shure had infringed the '186 Patent and ClearOne would suffer (and had suffered) irreparable harm. *Id.* at 15-24. Also, most of Shure's invalidity arguments failed. *Id.* at 25-27. But the bad news for ClearOne was that two prior-art references likely made the '186 Patent obvious (and thus invalid). *Id.* at 27-36.

First, the Court found that a 2001 book chapter authored by Dr. Walter Kellerman, called "Acoustic Echo Cancellation for Beamforming Microphone Arrays," created a substantial question on the patent's validity. *See* R. 158-2, Kellerman Decl. Exh. 2 ("Kellerman 2001"). Kellerman's chapter discloses a method of combining acoustic echo cancellation and beamforming that involves performing AEC "only on fixed (time-invariant) beams and then select[ing] which beam to transmit to the far end." Memo Op. and Order at 28-29. Kellerman found that performing AEC only on fixed beams was more cost-effective than performing it on adaptive beams or on individual microphones before beamforming. Kellerman 2001 at 299. That is, "Kellerman saw the same problem as the '186 patent (the problem of efficiently combining AEC and beamforming) and arrived at the same solution (save on AEC costs by performing AEC on a smaller number of fixed beams." Memo Op. and Order at 29. The Court noted that Kellerman 2001 did *not* disclose "last mic on"—the second contribution of the '186 Patent. *Id.* at 32. But the Court reasoned that because "[l]ast mic on was a well-known industry feature for decades before the publication of the

Kellerman chapter or the issuance of the '186 patent,” it would have been obvious to combine that feature with the AEC method Kellerman proposed. *Id.* at 32-33.

The second problematic piece of prior art was a 1997 article, also authored by Kellerman, entitled “Strategies for Combining Acoustic Echo Cancellation and Adaptive Beamforming Microphone Arrays” (Kellerman 1997). The Court held that Kellerman 1997 likely rendered the patent obvious for the same reasons that Kellerman 2001 did: both references disclosed the idea of “reducing processing costs by decomposing beamforming into ‘time-invariant’ (fixed) and ‘time-variant’ parts and then performing AEC only on the time-invariant part.” Memo Op. and Order at 35 at 35-36. The Court further noted that Kellerman 1997 might actually have anticipated the '186 Patent—as opposed to simply making it obvious—but declined to definitively determine whether Kellerman 1997 disclosed the last mic on feature. *Id.* at 36-37.

### **C. PTAB Proceedings**

Shortly before the Court issued its preliminary-injunction decision on the '186 Patent, the Patent Trial and Appeal Board, which had initiated *inter partes* review of the '553 Patent, found a reasonable likelihood that Shure would prevail on its obviousness argument against the '553 Patent based on Kellerman 2001. *See* R. 244, Patel Exh. 35, PTAB Initial IPR Decision at 11-14. Relying in part on the PTAB's preliminary decision, the Court noted in its preliminary-injunction decision that “the PTAB's opinion on the '553 patent [was] persuasive authority” because the

illustrative claim in the '553 Patent (Claim 1) was nearly identical to Claim 7 of the '186 Patent. Memo Op. and Order at 28.

Since then, the PTAB has reversed its preliminary finding on the '553 Patent's validity. The PTAB's final decision held that Shure failed to establish that the representative claims of the '553 Patent were unpatentable. PTAB Final IPR Decision at 48. Specifically, the PTAB held that Shure did not prove by a preponderance of the evidence that Kellerman 2001 disclosed "fixed beams." *Id.* at 29.

## II. Standard of Review

The parties disagree on the correct standard for evaluating this motion. ClearOne proposes that either Rule 59(e) or Rule 60(b) applies. Mot. Reconsider at 7 n.8. Shure argues that neither Rule 59(e) nor Rule 60(b) applies to this motion and that it should be denied as a result. R. 487, Shure Resp. at 1-2 (redacted). Shure is correct on the first point. The motion falls outside the scope of Rule 59(e) because it was not filed within 28 days of the initial preliminary-injunction decision, and that decision is not a "judgment." *See* Fed. R. Civ. P. 59(e). And Rule 60(b) is also a poor fit, because that rule applies to a "final judgment." *See* Fed. R. Civ. P. 60(b); Fed. R. Civ. P. 60 advisory committee notes (explaining that "interlocutory judgments are not brought within the restrictions of the rule.").

But that is not the end of the analysis. In reality, the motion is covered by Rule 54(b), which gives the Court discretion to reconsider any decision that "adjudicates fewer than all the claims or the rights and liabilities of fewer than all the parties ... at any time before the entry of a judgment adjudicating [the entire case]." Fed. R. Civ.

P. 54(b); *Terry v. Spencer*, 888 F.3d 890, 893 (7th Cir. 2018) (“[D]istrict court judges may reconsider interlocutory orders at any time before final judgment.”). ClearOne’s briefing acknowledges this possibility but understandably equivocates out of concern that Rule 54(b) may not apply to an appealable order like a preliminary injunction. *See* Mot. Reconsider at 7 n.8 (citing *Galvan v. Norberg*, 678 F.3d 581, 586-87 (7th Cir. 2012) (finding that the district court had authority to consider a motion to reconsider a new trial order in part because the order was *not* appealable)); *see also* R. 494, ClearOne Reply at 4. But nothing in Rule 54(b) or Seventh Circuit case law precludes the district court from considering this motion solely because the underlying decision happens to be appealable. The motion falls well within the broad language of the Rule. *See Christianson v. Colt Indus. Operating Corp.*, 486 U.S. 800, 817 (1988) (“A court has the power to revisit prior decisions of its own ... in any circumstance, although as a rule courts should be loath[] to do so in the absence of extraordinary circumstances.”).

### **III. Analysis**

To start, is true that the Court considered the PTAB’s initial decision to be “persuasive authority” at the preliminary injunction stage. Memo Op. and Order at 28 (“The ’553 patent’s claims are very similar to the ’186’s patent’s claims, so that PTAB’s opinion on the ’553 patent is persuasive authority in this Court’s analysis of the ’186’s patent’s validity.”). But that is not to say that the Court relied on it all that much. Instead, the Court independently considered Shure and ClearOne’s arguments on Kellerman 2001 and came to its own conclusion. *See id.* at 27-28; *but see* Mot.

Reconsider at 9 (“[T]he court relied on the PTAB’s IPR institution decision ... in denying ClearOne’s motion.”). Of course the Court will also consider the PTAB’s final IPR decision in evaluating this motion to reconsider, but is important to note that it is not binding. Especially considering the high bar for preliminary injunctive relief, the Court must make its own determination on whether to revise its previous decision.

Continuing on to the core issue here, the main point of disagreement between the parties, and between the preliminary injunction decision and the PTAB decision, is whether Kellerman 2001 discloses “fixed beams.” The two decisions use identical definitions of the term “fixed beam.” The Court preliminarily construed a fixed beam as a beam “defined by parameters determined before a conference,” and the PTAB explicitly adopted the same definition. Memo Op. and Order at 9-10; PTAB Final IPR Decision at 18. The PTAB found that Shure had not met its burden of establishing that Kellerman 2001 disclosed fixed beams under that definition, and that as a result Kellerman 2001 did not invalidate the ’553 Patent. PTAB Final IPR Decision at 19-29.

In the PTAB proceedings, Shure pointed to Figure 13.8 of Kellerman 2001, as well as paragraphs from Kellerman’s and Leblanc’s declarations, to argue that the chapter disclosed fixed beamforming. PTAB Final IPR Decision at 21-22. ClearOne responded by essentially arguing that the “fixed” beamforming described in Figure 13.8 and its surrounding paragraphs was not really “fixed” under the PTAB’s construction of the term, but that it instead allowed for beams to be adjusted even

during a conference. *Id.* at 23. The PTAB considered Figure 13.8 and its surrounding paragraphs at length and ultimately agreed with ClearOne. *Id.* at 23-26. As a result, the PTAB opined that those portions of Kellerman 2001 did *not* disclose fixed beamforming. *Id.*

The section of Kellerman 2001 on which the PTAB focused its decision does discuss adaptive beamforming at length. Broadly, Section 13.5 of Kellerman 2001 proposes various methods of integrating AEC into adaptive beamforming. *See* Kellerman 2001 at 297-302. Figure 13.8 depicts one of those possible methods: “cascading” beamforming, which involves applying AEC first to “fixed” beams and then using a “time-varying” (or, adaptive) voting mechanism to choose between the beams to be used. *See id.* at 297-300; R. 487-14, Patel Exh. 13, LeBlanc IPR Decl. ¶¶ 57-60. It was this use of “fixed” beams that Shure emphasized and that the PTAB found unpersuasive. PTAB Final IPR Decision at 24-25. The PTAB ultimately concluded that the chapter did not disclose fixed beamforming because “[a]ll of the paragraphs describing the Fixed Beamforming block and the Beam design and Control block in Figure 13.8 contain[ed] some reference to adaptive or time-variant beamforming.” *Id.* at 26.

But the PTAB’s final decision does not appear to consider in detail the possibility that Kellerman 2001 discloses *both* fixed and adaptive beamforming, as this Court previously decided it did. Memo Op. and Order at 29-32. The prior Opinion acknowledged that Kellerman 2001 disclosed adaptive beamforming. *Id.* But because it *also* disclosed fixed beamforming, the Court reasoned, it still essentially previewed



the representative claims of the '186 Patent. *Id.* at 31. The two are not mutually exclusive. *Id.* (“[T]he fact that Kellerman discloses the *option* of updating the fixed beams during conference does not change the fact that his book chapter *first* disclosed the basic idea of holding the beams fixed.”).

It is clear from the text of Kellerman 2001 that the chapter discloses the same key aspect of the '186 Patent: performing AEC on fixed beams, which cuts down on computational costs, rather than performing AEC on adaptive beams. Kellerman 2001 explicitly states that “decompos[ing] [the beamformer] into a time-invariant [fixed] and a time-varying [adaptive] part ... with AEC acting *only on the output of the time-invariant part*” reduces the computational burden of AEC. Kellerman 2001 at 297 (emphasis added). The fact that Kellerman then additionally proposes selecting which signals to transmit to the far end using a time-varying voting mechanism does not change that fact. *See id.* at 299-300. That is discussed at length in the Court’s prior Opinion. *See* Memo Op. and Order at 29-30.

Of course, Kellerman 2001 does not totally rule out the possibility that the “fixed” beams it describes might be updated during a conference. *See* Kellerman 2001 and 300 (“The monitoring of [] fixed beams, or the learning of optimum beamformers for deciding upon [the beams] can be carried out during an initial training phase only, or continuously.”). But in that same paragraph, Kellerman issues a warning about updating the beams too often. *Id.* He clarifies that “as long as updating of [the beams] occurs less frequently than significant changes in the acoustic path, the model of time-invariant beamforming is justified with respect to AEC behavior,” and notes

that updates should only occur at certain times, such as “at the beginning of far-end speech only periods.” *Id.* Kellerman is clearly *not* endorsing continuously changing beams for use with AEC. The idea is the same as in the ’186 Patent: applying AEC to fixed beams is less computationally burdensome than applying it to adaptive beams or to microphones before beamforming.

One final note, this one on infringement: Shure argues that reconsidering the preliminary-injunction decision in light of the PTAB decision would undermine the Court’s previous preliminary *infringement* decision. Shure Resp. at 3-5. That is not necessarily true. Essentially, Shure maintains that because the MXA910’s beams *can* be adaptive in the way that Kellerman proposes, if Kellerman’s beams are adaptive, so are Shure’s. *Id.* But the prior Opinion explained that the MXA910 infringed the patent because a fixed-beams setting is the MXA910’s default mode—not because the MXA910 *could not* use adaptive beams. Memo Op. and Order at 16-17. The Court reasoned that because a user would have to proactively turn on adaptive beamforming during a conference, the MXA910 infringed whenever a user did not make that choice. *Id.* That reasoning still holds. All that the PTAB decision adds to this equation is confirmation that a *non-infringing* use of the MXA910 might exist. In any event, as explained above, the PTAB decision does not undermine the Court’s preliminary injunction finding that Kellerman 2001 creates a substantial question of the ’186 Patent’s validity.

#### IV. Conclusion

For the reasons explained above, ClearOne's motion to reconsider, R. 481, is denied.

ENTERED:

s/Edmond E. Chang  
Honorable Edmond E. Chang  
United States District Judge

DATE: August 25, 2019