

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

VOCALIFE LLC,

Plaintiff,

v.

AMAZON.COM, INC., AMAZON.COM
LLC,

Defendants.

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CIVIL ACTION NO. 2:19-CV-00123-JRG

CLAIM CONSTRUCTION MEMORANDUM OPINION AND ORDER

Before the Court is the opening claim construction brief of Vocalife LLC (“Plaintiff”) (Dkt. No. 68),¹ the response of Amazon.com, Inc. and Amazon.com LLC (collectively “Defendants”) (Dkt. No. 69), and Plaintiff’s reply (Dkt. No. 75). The Court held a hearing on the issues of claim construction and claim definiteness on March 24, 2020. Having considered the arguments and evidence presented by the parties at the hearing and in their briefing, the Court issues this Order.

¹ Citations to the parties’ filings are to the filing’s number in the docket (Dkt. No.) and pin cites are to the page numbers assigned through ECF.

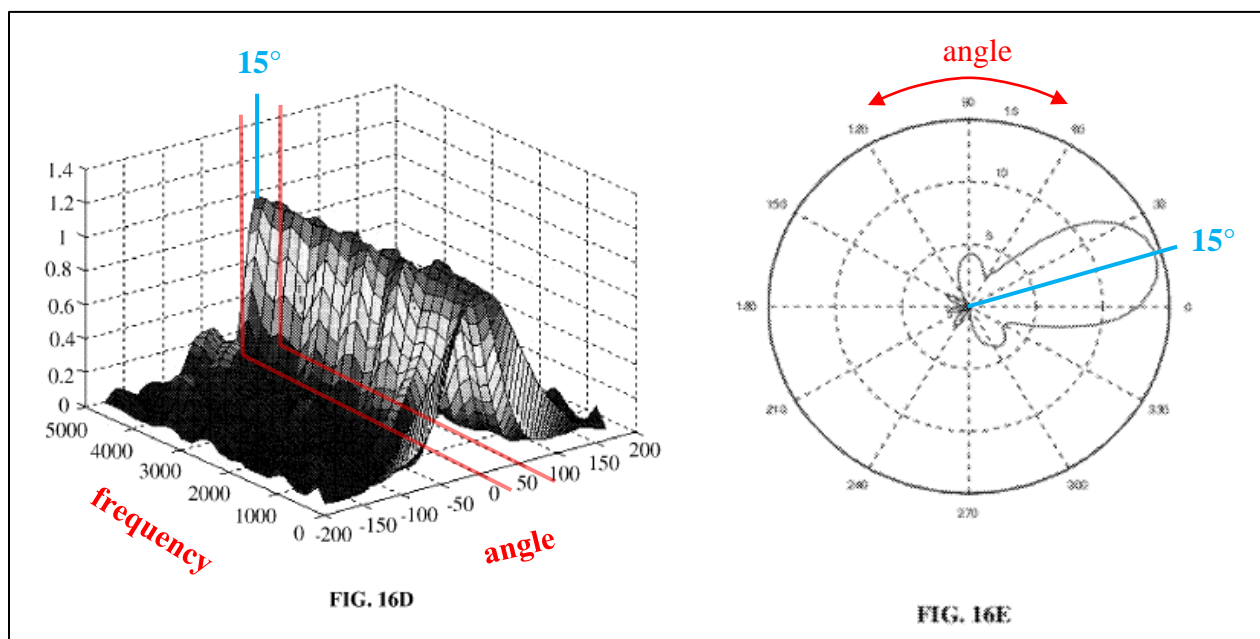
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I. BACKGROUND

Plaintiff alleges infringement of U.S. Patent No. RE47,049 (the “’049 Patent”). The ’049 Patent is entitled Microphone Array System. The ’049 Patent is a reissue of U.S. Patent No. 8,861,756 and lists an earliest priority claim to U.S. Patent Application No. 61/403,952, filed on September 24, 2010.

In general, the ’049 Patent is directed to technology for “enhancing acoustics of a target sound signal received from a target sound source, while suppressing ambient noise signals.” ’049 Patent col.2 ll.6–8. The general approach utilizes an array of sound sensors such as microphones. The array does not require a specific geometric configuration. *Id.* at col.2 ll.23–26, col.3 ll.45–53. The array has a directivity pattern, which denotes the array’s response as a function of frequency and direction of the sound signal. *Id.* at col.5 l.51 – col.6 l.5. Figures 16D and 16E, reproduced and annotated below, depict an exemplary directivity pattern for an eight-sensor array steered to 15°. *Id.* at col.16 l.55 – col.18 l.43.² The patent describes forming and steering the directivity pattern



² The ’049 Patent describes Figure 16D as depicting a directivity pattern steered to 60° but the peak of the pattern is at 15° in the figure. The pattern depicted in Figure 16C is described as steered to 15° but is depicted as peaked at 60°.

by determining the relative timing of receipt of the target signal at each sensor in the array and applying filter-weights to each sensor that are based on this relative timing. *Id.* at col.7 l.33 – col.11 l.21. Different filter-weights yield different directivity patterns. *Id.* For example, Figures 16E through 16L depict different directivity patterns for the microphone array depicted in Figures 16A and 16B. The patterns are steered toward different angular positions by applying different filter-weights to the microphones of the array. *Id.* at col.16 l.55 – col.18 l.43.

The abstract of the '049 Patent provides:

A method and system for enhancing a target sound signal from multiple sound signals is provided. An array of an arbitrary number of sound sensors positioned in an arbitrary configuration receives the sound signals from multiple disparate sources. The sound signals comprise the target sound signal from a target sound source, and ambient noise signals. A sound source localization unit, an adaptive beamforming unit, and a noise reduction unit are in operative communication with the array of sound sensors. The sound source localization unit estimates a spatial location of the target sound signal from the received sound signals. The adaptive beamforming unit performs adaptive beamforming by steering a directivity pattern of the array of sound sensors in a direction of the spatial location of the target sound signal, thereby enhancing the target sound signal and partially suppressing the ambient noise signals, which are further suppressed by the noise reduction unit.

Claim 1 of the '049 Patent, an exemplary method claim, recites as follows (with deletions from U.S. Patent No. 8,861,756 denoted with strikethrough and additions denoted with underline):

1. A method for enhancing a target sound signal from a plurality of sound signals, comprising:
 - providing a microphone array system comprising an array of sound sensors positioned in ~~an arbitrary~~ a linear, circular, or other configuration, a sound source localization unit, an adaptive beamforming unit, and a noise reduction unit, wherein said sound source localization unit, said adaptive beamforming unit, and said noise reduction unit are integrated in a digital signal processor, and wherein said sound source localization unit, said adaptive beamforming unit, and said noise reduction unit are in operative communication with said array of said sound sensors;
 - receiving said sound signals from a plurality of disparate sound sources by said sound sensors, wherein said received sound signals comprise said target sound signal from a target sound source among said disparate sound sources, and ambient noise signals;
 - determining a delay between each of said sound sensors and an origin of said array of said sound sensors as a function of distance between each of said

sound sensors and said origin, a predefined angle between each of said sound sensors and a reference axis, and an azimuth angle between said reference axis and said target sound signal, when said target sound source that emits said target sound signal is in a two dimensional plane, wherein said delay is represented in terms of number of samples, and wherein said determination of said delay enables beamforming for ~~arbitrary numbers of~~ said array of sound sensors ~~and in~~ a plurality of ~~arbitrary~~ configurations ~~of said array of said sound sensors~~;

estimating a spatial location of said target sound signal from said received sound signals by said sound source localization unit;

performing adaptive beamforming for steering a directivity pattern of said array of said sound sensors in a direction of said spatial location of said target sound signal by said adaptive beamforming unit, wherein said adaptive beamforming unit enhances said target sound signal and partially suppresses said ambient noise signals; and suppressing said ambient noise signals by said noise reduction unit for further enhancing said target sound signal.

II. LEGAL PRINCIPLES

A. Claim Construction

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). To determine the meaning of the claims, courts start by considering the intrinsic evidence. *Id.* at 1313; *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc’ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). The intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *Phillips*, 415 F.3d at 1314; *C.R. Bard, Inc.*, 388 F.3d at 861. The general rule—subject to certain specific exceptions discussed *infra*—is that each claim term is construed according to its ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the patent. *Phillips*, 415 F.3d at 1312–13; *Alloc, Inc. v. Int’l Trade Comm’n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003); *Azure Networks, LLC v. CSR PLC*, 771 F.3d 1336, 1347 (Fed. Cir. 2014) (“There is a heavy presumption

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