UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD
AMAZON.COM, INC., Petitioner,
v.
VOCALIFE LLC, Patent Owner.
IPR2021-01331 U.S. Patent No. RE48,371

DECLARATION OF JOHN M. STRAWN, PH.D. IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF CLAIMS 22-41 OF U.S. PATENT NO. RE48,371





TABLE OF CONTENTS

I.	BAC	BACKGROUND 1						
	A Experience and Qualifications							
	B.	The Instant Case	3					
	C.	Topics of Opinions	4					
	D.	Materials Considered						
II.	APP	APPLICABLE LEGAL STANDARDS 8						
	A.	Claim Construction	9					
	B.	Obviousness	11					
III.	III. PERSON OF ORDINARY SKILL IN THE ART							
IV.	TEC	TECHNOLOGY BACKGROUND1						
	A.	Microphone Array Systems Were Well-Known	17					
	B.	Determining Delays For Microphone Arrays Was Well-Known	18					
	C.	Adaptive Beamforming Algorithms Were Well-Known	19					
	D.	Sound Source Localization Algorithms Were Well-Known	20					
	E.	Noise Reduction Algorithms Were Well-Known	22					
	F.	Echo Cancellation Algorithms Were Well-Known	23					
	G.	Using DSPs For Signal Processing Was Well-Known	24					
V.	THE	E '371 PATENT	28					
VI.	OVERVIEW OF THE GROUNDS							
	A.	Summary Of Opinions And Listing Of The Grounds	37					
	В.	The References Are Prior Art	37					



VII.	CLAIMS 22-41 OF THE '371 PATENT WOULD HAVE BEEN OBVIOUS					
	A.	Ground 1: Reuss and Dmochowski				
		1.	Claim 38			
			a.	Prea	mble	39
			b.	Arra	y of Sound Sensors	40
			c.	DSP		42
				i.	Beamforming Unit	43
				ii.	Echo Cancellation Unit	46
				iii.	Noise Reduction Unit	48
				iv.	Sound Source Localization Unit	49
					(a) SSL Unit That Estimates a Target Sound Signal's Location	49
					(b) By Determining a Delay	57
				v.	A DSP Comprising the Four Units	61
		2.	Clair	m 39		65
	В.	Grou	and 2: 1	Reuss,	Dmochowski, and Li	66
		1.	Clair	m 22		66
			a.	Prea	mble	67
			b.	A M	icrophone Array System	67
				i.	Array of Sound Sensors	67
				ii.	SSL Unit	67
				iii.	Adaptive Beamforming Unit	68



Amazon.com v. Vocalife LLC

Declaration of Dr. John M. Strawn, Ph.D. – U.S. Patent RE48,371

			iv.	Noise Reduction Unit	69
			v.	Echo Cancellation Unit	69
			vi.	Implemented in a DSP	69
			vii.	Operative Communication	70
		c.	Rece	iving Sound Signals	71
		d.	Dete	rmining a Delay	71
			i.	Delay in Number of Samples	74
			ii.	Delay Enables Beamforming	79
		e.	Estin	nating Target Sound Signal Location	80
		f.	Perfo	orming Adaptive Beamforming	81
		g.	Perfo	orming Echo Cancellation	81
		h.	Supp	pressing Ambient Noise	82
	2.	Claim 30			82
	3.	Claim 28			82
	4.	Claim 37			83
	5.	Claims 40-41			85
C.	Ground 3: Reuss, Dmochowski, Li, and Brandstein				
	1.	Claims 23 and 31			86
	2.	Claims 24-25, 27, 32-33, and 35			92
		a.	Clair	ms 24 and 32	96
			i.	Providing a Fixed Beamformer, Blocking Matrix, and Adaptive Filter	96
			ii.	Steering Directivity Pattern of Fixed Beamformer	97



Amazon.com v. Vocalife LLC Declaration of Dr. John M. Strawn, Ph.D. – U.S. Patent RE48,371

			111.	Feeding Ambient Noise Using a Blocking Matrix	98		
			iv.	Adaptively Filtering Ambient Noise Signals in Response to Voice Activity Detection			
		b.	Clair	ms 25 and 33	100		
		c.	Clair	ms 27 and 35	101		
		d.		vations to Combine Brandstein's GJBF with s	105		
D.	Grou	Ground 4: Reuss, Dmochowski, Li, Brandstein, and Abutalebi -					
	1.	Clair	Claims 26 and 34				
		a.	Sub-	band Adaptive Filtering	109		
		b.		ting Enhanced Target Sound Signal and ient Noise Signals	110		
		c.		otively Filtering Ambient Noise Signals in Frequency Sub-Band	113		
		d.	Synt	hesizing a Full-Band Sound Signal	114		
	2.	Clair	Claims 29 and 36 1				
		a.	Sub-	Band Noise Reduction	115		
		b.	Dela	y (τ)	119		
	3.	Motivations to Combine					
E.	Grou	Ground 5: Chen and Dmochowski					
	1.	Clair	Claim 38				
		a.	Prea	mble	123		
		b.	Arra	y of Sound Sensors	124		
		c.	DSP		125		



DOCKET

Explore Litigation Insights



Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time** alerts and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.

