UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,

Petitioner,

v.

JAWBONE INNOVATIONS, LLC,

Patent Owner.

Case IPR2022-01124

U.S. Patent No. 11,122,357

DECLARATION OF JEFFREY S. VIPPERMAN, PH.D.

DOCKET ALARM
Find authenticated court documents without w
Samsung v. Jawbone
IPR2022-01321
Exhibit 1003

TABLE OF CONTENTS

I. INTRODUCTION 1
II. SUMMARY OF OPINIONS 1
III. BACKGROUND AND QUALIFICATIONS 2
A. Education 2
B. Experience 3
C. Compensation 7
IV. MATERIALS CONSIDERED 7
V. LEGAL STANDARDS 9
A. Claim Construction 9
B. Level of Ordinary Skill 10
C. Obviousness 10
VI. '357 PATENT 13
A. Specification 13
B. Prosecution History 17
VII. ANALYSIS OF PETITION GROUNDS 18
A. Overview of the Asserted References 18
1. Kanamori (Ex. 1005) 18
2. McCowan (Ex. 1006) 20
3. Elko (Ex. 1009) 22
B. Simulations of Virtual Microphone Responses 23
C. Claim Construction 34

DOCKET ALARM
Find authenticated court documents without watermarks at docketalarm.com.

A. Kanamori, Elko, and McCowan Render Obvious Claims 1-20 35

1. Independent Claim 1 35

a. [1P] "A device, comprising:" 35

b. [1A]: "a first virtual microphone comprising a first combination of a first microphone signal and a second microphone signal, wherein the first microphone signal is generated by a first physical microphone and the second microphone signal is generated by a second physical microphone;" 35

c. [1B]: "a second virtual microphone comprising a second combination of the first microphone signal and the second microphone signal," 40

d. [1C]: "wherein the second combination is different from the first combination," 42

e. [1D]: "wherein the first virtual microphone and the second virtual microphone are distinct virtual directional microphones with substantially similar responses to noise and substantially dissimilar responses to speech; and" 43

f. [1E]: "a signal processor coupled with the first and second microphone signals and operative to combine the first and second microphone signals by filtering and summing in the time domain, to apply a varying linear transfer function between the first and second microphone signals, and to generate an output signal having noise content that is attenuated with respect to speech content." 65

2. Dependent Claims 2-14 79

a. Claim 2: "The device of claim 1, wherein the signal processor comprises one or more digital signal processors (DSPs)." 79

DOCKET ALARM
Find authenticated court documents without watermarks at docketalarm.com.

b. Claim 3: "The device of claim 1, wherein the noise content comprises acoustic noise and the speech content comprises human speech."....80

c. Claim 4: "The device of claim 1, wherein the signal processor is operative to add a delay to the first microphone signals."....81

d. Claim 5: "The device of claim 4, wherein the signal processor is operative to raise the delay to a power that is proportional to a time difference between arrival of the speech at the first virtual microphone and arrival of the speech at the second virtual microphone."....81

e. Claim 6: "The device of claim 4, wherein the signal processor is operative to raise the delay to a power that is proportional to a sampling frequency multiplied by a quantity equal to a third distance subtracted from a fourth distance, the third distance being between the first physical microphone and a speech source of the speech and the fourth distance being between the second physical microphone and the speech source."....84

f. Claim 7: "The device of claim 1, wherein the first and second physical microphones comprise omnidirectional microphones."....86

g. Claim 8: "The device of claim 1, wherein the first and second physical microphones are included in a microphone array."....86

h. Claim 9: "The device of claim 1, wherein the first physical microphone and the second physical microphones are disposed along an axis and are separated from each other by a first distance."....86

i. Claim 10: "The device of claim 9, wherein a midpoint of the axis is a second distance from a speech source that generates the speech, wherein

DOCKET ALARM
Find authenticated court documents without watermarks at docketalarm.com.

the speech source is located in a direction defined by an angle relative to the midpoint." 87

j. Claim 11: "The device of claim 10, wherein the first virtual microphone is formed by subtracting the second microphone signal from the first microphone signal." 90

k. Claim 12: "The device of claim 10, wherein the second virtual microphone is formed by subtracting the first microphone signal from the second microphone signal." 91

l. Claim 13: "The device of claim 1, wherein the first virtual microphone is formed by subtracting the second microphone signal from a delayed version of the first microphone signal." 93

m. Claim 14: "The device of claim 1, wherein the second virtual microphone is formed by subtracting the first microphone signal from a delayed version of the second microphone signal." 94

3. Independent Claim 15 96

a. [15P]: "A device, comprising:" 96

b. [15A]: "a first virtual microphone comprising a first combination of a first microphone signal and a second microphone signal, wherein the first microphone signal is generated by a first physical microphone and the second microphone signal is generated by a second physical microphone;" 96

c. [15B]: "a second virtual microphone comprising a second combination of the first microphone signal and the second microphone signal," 96

d. [15C]: "wherein the second combination is different from the first combination," 96

DOCKET ALARM
Find authenticated court documents without watermarks at docketalarm.com.

DOCKET ALARM

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.