UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE PATENT TRIAL AND APPEAL BOARD —————

APPLE INC., Petitioner,

v.

VALENCELL, INC., Patent Owner

Case IPR2017-00321 U.S. Patent No. 8,923,941

DECLARATION OF DR. MAJID SARRAFZADEH IN SUPPORT OF PETITIONER APPLE INC.'S OPPOSITION TO PATENT OWNER'S MOTION TO AMEND

Mail Stop "Patent Board"
Patent Trial and Appeal Board
U.S. Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450



TABLE OF CONTENTS

| I. | Introduction | | |
|------|----------------|---|-----------|
| II. | Qualifications | | |
| III. | Leg | gal Principles | 5 |
| IV. | Val | lencell's Conditional Motion to Amend | .10 |
| | A. | Overview | .10 |
| | B. | Level of Ordinary Skill of a Person in the Art | .12 |
| | C. | Claim Construction | .12 |
| | | 1. "application-specific interface (API)" | .12 |
| V. | | ound 1: Substitute claims 22–23 and 29 are unpatentable under pre-AIA U.S.C. § 103(a) over Kosuda in view of Gupta and Maekawa | |
| | A. | Overview of Kosuda | .16 |
| | B. | Overview of Maekawa | .21 |
| | C. | Overview of Gupta | .24 |
| | D. | Substitute claim 22 | 27 |
| | | [22.P] A wearable device | .27 |
| | | [22.1] a housing | .28 |
| | | [22.2] a chipset enclosed within the housing | .28 |
| | | [22.3] at least one PPG sensor | .30 |
| | | [22.4] at least one motion sensor | .32 |
| | | [22.5.1] at least one signal processor configured to process signals from the at least one motion sensor and signals from the at least one PPG sensor to reduce motion artifacts from the PPG signals and to extract physiological and motion parameters; | S |
| | | wherein the at least one signal processor configured to process data be output, wherein the output data comprises physiological information and motion-related information; | <u>to</u> |
| | | wherein the output data is parsed out such that an application-specific interface (API) can utilize the physiological information and motion-related information for an application | |



| | | exposes the at least one PPG sensor to a body of a subject weari the device | _ |
|------|----|--|------------------|
| | | [22.9] the housing comprises non-air light transmissive material in optical communication with the at least one PPG sensor and the window | |
| | E. | Substitute claim 23 | .41 |
| | F. | Substitute claim 29 | .42 |
| VI. | | ound 2: Claims 26–28 are unpatentable under pre-AIA 35 U.S.C. § 1030 r Kosuda in view of Gupta, Maekawa, and Han | |
| | A. | Overview of Han | .45 |
| | B. | Rationale to Combine the Teachings of Kosuda, Gupta, Maekawa, and Han | |
| VII. | | ound 3: Substitute claims 22-27 and 29 are unpatentable under pre-AIA U.S.C. § 103(a) over Aceti in view of Craw and Fricke | |
| | A. | Overview of Aceti | .51 |
| | B. | Overview of Fricke | .54 |
| | C. | Overview of Craw | .59 |
| | D. | Substitute claim 22 | .63 |
| | | [22.P] A wearable device | .63 |
| | | [22.1] a housing | .63 |
| | | [22.2] a chipset enclosed within the housing | .64 |
| | | [22.3] at least one PPG sensor | .66 |
| | | [22.4] at least one motion sensor | .67 |
| | | [22.5.1] at least one signal processor configured to process signals from the at least one motion sensor and signals from the at least one PPG sensor to reduce motion artifacts from the PPG signals and to extract physiological and motion parameters | } |
| | | [22.5.2] the at least one signal processor configured to process data be output, the output data comprises physiological information and motion-related information | <u>to</u> .70 |
| | | [22.5.3] the output data is parsed out such that an application-specific interface (API) can utilize the physiological information and motion-related information for an application | |

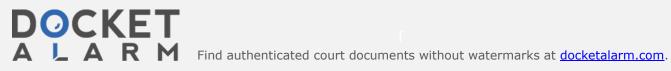


| | | [22.8] the housing comprises at least one window that optically exposes the at least one PPG sensor to a body of a subject wear the device | _ |
|-------|-----|--|----|
| | | [22.9] the housing comprises non-air light transmissive material in optical communication with the at least one PPG sensor and the window | ie |
| | E. | Substitute claim 23 | 75 |
| | F. | Substitute claims 24 and 25 | 75 |
| | G. | Substitute claims 26 and 27 | 76 |
| | H. | Substitute claim 29 | 84 |
| VIII. | | ound 4: Substitute claim 28 is unpatentable under pre-AIA 35 U.S.C. 03(a) over Aceti in view of Craw, Fricke and Comtois | 84 |
| | A. | Overview of Comtois | 85 |
| | B. | Rationale to Combine the Teachings of Aceti, Craw, Fricke, and Comtois | 88 |
| IV | Cor | nelucion | QQ |



PETITIONER'S UPDATED EXHIBIT LIST

| Exhibit No. | Description |
|-------------|---|
| 1001 | U.S. Patent No. 8,923,941 to LeBoeuf et al., issued December 30, |
| | 2014 |
| 1002 | U.S. Patent No. 8,923,941 File History |
| 1003 | Declaration of Dr. Majid Sarrafzadeh |
| 1004 | Curriculum Vitae of Dr. Majid Sarrafzadeh |
| 1005 | Valencell, Inc. v. Apple Inc., Case No. 5-16-cv-00010 (E.D.N.C), Complaint filed January 4, 2016 |
| 1006 | U.S. Patent Application Publication No. 2005/0209516 to Fraden, |
| 1000 | published September 22, 2005 |
| 1007 | Intentionally left blank |
| 1008 | U.S. Patent Application Publication No. 2008/0081972 to |
| | Debreczeny, published April 3, 2008 |
| 1009 | Japanese Patent Application Publication No. 2005/040261 A to |
| | Numaga et al., published February 17, 2005 |
| 1010 | Certified English-language translation of Japanese Patent |
| | Application Publication No. 2005/040261 A to Numaga et al., |
| | published February 17, 2005 |
| 1011 | U.S. Patent Application Publication No. 2003/0065269 to Vetter et |
| 1010 1015 | al., published April 3, 2003 |
| 1012 – 1015 | Intentionally left blank |
| 1016 | U.S. Patent Application Publication No. 2009/0105556 to Fricke <i>et</i> |
| 1017 | al., published April 23, 2009 Intentionally left blank |
| 1017 | U.S. Patent No. 3,704,706 to Herczfeld <i>et al.</i> , issued December 5, |
| 1010 | 1972 |
| 1019 | U.S. Patent No. 5,297,548 to Pologe, issued March 29, 1994 |
| 1020 | Med. Sci. Series, Int'l Fed'n for Med. and Biological Eng'g and the |
| | Int'l Org. for Med. Physics, Design of Pulse Oximeters (J.G. |
| | Webster ed., Inst. of Physics Publ'g 1997) |
| 1021 | John Allen, Photoplethysmography and its application in clinical |
| | physiological measurement, Physiological Measurement 28 (2007) |
| 1022 | U.S. Patent Application Publication No. 2008/0132798 to Hong <i>et</i> |
| | al., published June 5, 2008 |



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.

