

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Ammar Al-Ali
U.S. Patent No.: 10,687,745 Attorney Docket No.: 50095-0045IP2
Issue Date: June 23, 2020
Appl. Serial No.: 16/835,772
Filing Date: March 31, 2020
Title: PHYSIOLOGICAL MONITORING DEVICES, SYSTEMS,
AND METHODS

DECLARATION OF DR. BRIAN W. ANTHONY

TABLE OF CONTENTS

I.	Background	10
II.	Level of Ordinary Skill in the Art.....	11
III.	Interpretations of the '745 Patent Claims at Issue	12
IV.	Prior Art Analysis	12
A.	Ground 1A: Claims 1, 9, 15, and 18 are obvious over Ackermans in view of Savant	12
1.	Overview of Ackermans.....	12
2.	Overview of Savant	14
3.	The combination of Ackermans and Savant.....	15
4.	Reasons to combine Ackermans and Savant	16
5.	Analysis	18
B.	Ground 1B: Claims 20 and 27 are obvious over Ackermans and Savant in view of Venkatraman	37
1.	Overview of Venkatraman	37
2.	The combination of Ackermans, Savant, and Venkatraman.....	38
3.	Reasons to combine Ackermans, Savant, and Venkatraman.....	38
4.	Analysis	40
C.	Ground 2A: Claims 1, 9, 15, 18, 20, and 27 are obvious over Mendelson-799 in view of Haar, Venkatraman, and Savant	43
1.	Overview of Mendelson-799	43
2.	Overview of Haar	46
3.	The combination of Mendelson-799, Haar, Venkatraman, and Savant	48
4.	Reasons to combine Mendelson-799, Haar, Venkatraman, and Savant.....	48
5.	Analysis	57
V.	Legal Principles.....	81

A. Anticipation 81
B. Obviousness 81

I, Brian W. Anthony, of Cambridge, MA, declare that:

1. My name is Dr. Brian W. Anthony. I am an Associate Principal Research Scientist at the Institute of Medical Engineering & Science at Massachusetts Institute of Technology (MIT). I am also a Principal Research Scientist at MIT's Mechanical Engineering department, Director of the Master of Engineering in Advanced Manufacturing and Design Program at MIT, Director of Health Technology at the MIT Center for Clinical and Translational Research, a Co-Director of the Medical Electronic Device Realization Center of the Institute of Medical Engineering & Science, and Associate Director of MIT.nano. My current *curriculum vitae* is attached and some highlights follow.

2. I earned my B.S. in Engineering (1994) from Carnegie Mellon University. I earned my M.S. (1998) and Ph.D. (2006) in Engineering from MIT. My research focused on high-performance computation, signal processing, and electro-mechanical system design.

3. In 1997, I co-founded Xcitex Inc., a company that specialized in video-acquisition and motion-analysis software. I served as the Chief Technology Officer and directed and managed product development until 2006. Our first demo product was an optical ring for human motion measurement used to capture user hand motion in order to control the user's interaction with a computer. Many of the structural elements of our optical ring addressed the same system issues as

those described and claimed in the patent at issue. For example, our optical ring included multiple light emitting diodes, multiple photodetectors, techniques for modulation and synchronization, and noise reduction algorithms. We estimated human hand-motion based on how that motion changed the detected light. In our application, we did not try to eliminate motion artifact, we tried to measure it. In developing our ring, we considered well-known problems such as ambient light and noise. Motion Integrated Data Acquisition System (MiDAS) was our flagship video and data acquisition product which relied upon precise synchronization of multiple clocks for optical sensor and video acquisition, data acquisition, and external illumination.

4. I joined MIT in 2006 and was the Director of the Master of Engineering in Advance Manufacturing and Design Program for over ten years. The degree program covers four main components: Manufacturing Physics, Manufacturing Systems, Product Design, and Business Fundamentals. Many of the courses, projects, and papers my students undertake involve technologies relevant to the patent at issue, for example, sensor devices including non-invasive optical biosensors.

5. In 2011, I co-founded MIT's Medical Electronic Device Realization Center ("MEDRC") and currently serve as co-director. The MEDRC aims to create and deploy revolutionary medical technologies by collaborating with

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.