UNITED STATES PATENT AND TRADEMARK OFFICE

_____

BEFORE THE PATENT TRIAL AND APPEAL BOARD

_____

APPLE INC.,
Petitioner,

v.

CALIFORNIA INSTITUTE OF TECHNOLOGY,
Patent Owner.

_____

Case IPR2017-00728
Patent 7,421,032

_____

**DECLARATION OF BRENDAN FREY, PH.D.
REGARDING U.S. PATENT NO. 7,421,032
CLAIMS 18-23**

TABLE OF CONTENTS

I, Brendan Frey, Ph.D., declare as follows:

1.　　My name is Brendan Frey.

I.　BACKGROUND

2.　　I received a B.Sc. with Honors in Electrical Engineering from the University of Calgary in 1990, a M.Sc. in Electrical and Computer Engineering from the University of Manitoba in 1993, and a Ph.D. in Electrical and Computer Engineering from the University of Toronto in 1997.

3.　　Since July 2001, I have been at the University of Toronto, where I am a Professor of Electrical and Computer Engineering and Computer Science.

4.　　During my career I have conducted research in the areas of graphical models, error-correcting coding, machine learning, genome biology, medicine and computer vision. In 2015, I co-founded Deep Genomics Inc., a startup located in Toronto that is using artificial intelligence to find new medicines. Since then I have acted as its Chief Executive Officer. Deep Genomics has received over $17M in venture capital funding, mostly from Silicon Valley investors. Deep Genomics has recruited scientists and engineers from top universities, including MIT, Stanford, the University of California, San Diego, and the University of Toronto, and from competing biotech and software companies, including Amazon, Autodesk, Calico,

1

and Human Longevity. In 2017, I co-founded the Vector Institute for Artificial

Intelligence. The Vector Institute is internationally regarded as one of, if not the, top

artificial intelligence research institutes in the world. It has over $200M in funding

and its current and newly hired professors have chosen faculty positions at the

Vector Institute in preference to faculty offers from leading universities, including

Stanford and MIT, and to senior researcher offers from leading industrial labs,

including DeepMind, Google, Facebook, Microsoft and OpenAI.

5.   I have received a number of honors and awards for the research I have

conducted. In 2008, I was named a Fellow of the Institute for Electrical and

Electronic Engineers (IEEE), an honor given to a person with an "extraordinary

record or accomplishments" in the field of electrical engineering. In 2009, I was

named a Fellow of the American Association for the Advancement of Science

(AAAS), an honor that recognizes "efforts on behalf of the advancement of science

or its applications which are scientifically or socially distinguished." In 2009, I was

awarded a Steacie Fellowship for my work on the theory and implementation of

artificial and natural mechanisms for inferring patterns from data. The Steacie

Fellowship is awarded by the Natural Sciences and Engineering Research Council of

Canada (NSERC) to "outstanding and highly promising scientists and engineers"

who are faculty members of Canadian universities. In 2011, I received the

NSERC's John C. Polanyi Award, in recognition of my research on inferring genetic codes embedded in DNA that direct activities within cells. In 2015, I was elected as a Fellow of the Royal Society of Canada, with the following citation: "Professor Frey has contributed to the emergence of new fields of research in machine learning and genome biology. He was one of the first researchers to successfully train a deep neural network, and he was a pioneer in inventing message passing algorithms, which are now widely used. He co-developed the long-sought-after 'splicing code' for determining how genes are expressed and introduced a new approach to understanding the genetics of disease."

6.   Throughout my career I have received funding from various governmental agencies to support my research, including the Natural Sciences and Engineering Research Council of Canada, the Canadian Institutes of Health Research, and the Canadian Institute for Advanced Research.

7.   I have authored more than 200 publications and am named as an inventor on nine patents issued by the U.S. Patent and Trademark Office.

8.   A copy of my curriculum vitae is included as Exhibit 1266.

9.   I have reviewed the specification and claims of U.S. Patent No7,421,032 (the "'032 patent"; Ex. 1201). I have been informed that the '032

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.