UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ocean Tomo, LLC,
Petitioner

v.

Patent Ratings, LLC,
Patent Owner

Patent No. 9,075,849

Filing Date: July 22, 2014

Issue Date: July 7, 2015

Title: METHOD AND SYSTEM FOR PROBABILISTICALLY QUANTIFYING AND VISUALIZING RELEVANCE BETWEEN TWO OR MORE CITATIONALLY OR CONTEXTUALLY RELATED DATA OBJECTS

Case CBM: Unassigned

Declaration of Patrick Thomas, Ph.D. Under 37 C.F.R. § 1.132

I. INTRODUCTION

1. This Declaration provides an analysis of US Patent #9,075,849 (referred to hereafter as the '849 patent). This patent was issued on July 7, 2015, and is assigned to PatentRatings, LLC.

2. The main objective of this Declaration is to address the question of whether the '849 patent is directed to abstract ideas under current patent law. Specifically, it provides an opinion as to whether the '849 patent qualifies as eligible or ineligible following the recent *Alice* and *Bilski* cases decided by the US Supreme Court.

II. PROFESSIONAL BACKGROUND

3. ***Work Experience*** **-** I am a science and technology analyst, and my main expertise is in data mining and intellectual property analytics. I have worked with patent metrics, citation data and statistical models for over two decades.

4. I am currently a partner in 1790 Analytics LLC, which I co-founded in 2004. 1790 is a consulting firm focused on developing quantitative intellectual property metrics, and employing these metrics to answer a broad range of questions. I have consulted with many large corporations and financial institutions, helping them to identify and capitalize upon technological and investment opportunities. I have also examined a broad range of science and technology policy issues for various government agencies. My government clients include the US Department of Defense (DOD); US Department of Energy (DOE); the Intelligence Advanced Research Projects Activity (IARPA); National Institute of Standards & Technology (NIST); and the Small Business Administration (SBA). My commercial and investment clients are not revealed here for confidentiality reasons.

5. Before my work at 1790 Analytics, I was a Senior Analyst at CHI Research Inc., one of the pioneering companies in intellectual property metrics. While at CHI, I consulted with large corporations and government agencies, and developed subscription products aimed at the investment community. This work was again based extensively on quantitative patent metrics. I was employed at CHI from 1998 until 2004, which is when I co-founded 1790. Prior to CHI, I was an Assistant Professor in Quantitative Methods at Southampton Business School (UK).

6. ***Education*** - I was educated in the United Kingdom, earning a B.S. (First Class) in Management Science from the University of Manchester in 1991; an M.S. in Computer Science from the University of Birmingham in 1993; and a Ph.D. in Management Science and Statistics from Nottingham Trent University in 1998.

7. My Ph.D. thesis made extensive use of literature citation data, and was my first exposure to this type of information. Specifically, I examined the scholarly literature associated with management science theories, and designed models that forecast which theories would have lasting impact, and which theories would become fashions with only fleeting influence. These models made extensive use of multivariate statistical analysis, in order to identify characteristics that would differentiate between long-lasting ideas and fads. My thesis was published in 1999 as a book entitled “Fashions in Management Research: An Empirical Analysis.”

8. ***Publication History*** - I have published numerous articles in peer-reviewed journals, covering various subjects including technology assessment, science policy, company valuation, and investment analysis. While these articles cover a variety of topics, they share the same analytical core, namely the use of quantitative metrics and statistical models in assessing published literature and patents.

9. The first of these papers, published when I was still a Ph.D. student, proposed a quantitative citation-based method for determining the quality of academic journals. After joining CHI, and since co-founding 1790, my research has focused mainly on metrics related to patents, rather than literature. I have published a series of papers demonstrating the application of quantitative patent metrics in numerous contexts. These include forecasting patent renewal decisions; valuing merger and acquisition candidates; identifying undervalued stocks for investment purposes; tracing the historical development of technologies; and locating emerging technologies early in their lifetime. All of these papers have a strong quantitative base, and a number of them employ multivariate statistical analysis, a subject which is examined in more detail in this Declaration.

10. ***Patenting History*** - In addition to publishing articles in peer-reviewed journals, I also invented a US patent (US #7,832,211) based on my research on company valuation. This patent describes an algorithm that places a valuation on a company based on the strength of its patent portfolio, as measured via a variety of quantitative patent metrics. The patent-based valuation, which is derived via multiple regression analysis, is then compared to the current valuation of the company in the stock market. If the patent-based valuation is higher than the current valuation, then the company is rated as undervalued, and is thus a target for possible investment.

III. OVERVIEW OF TOOLS AND TECHNIQUES RELEVANT TO THE '849 PATENT

11. The '849 patent describes a system and method for identifying documents (especially patent documents) that are closely related to each other, based on their connections in a citation network. This citation network consists of documents (the nodes in the network) connected via citations that form the links between these nodes. These citations may be, for

example, prior art references in the case of patents, or reference lists in the case of scientific papers.

12. The ‘849 patent is directed to two basic tools of research – bibliometrics and statistical analysis. It is thus instructive to examine the development of these two research areas, in order to provide context for the subsequent analysis of the ‘849 patent.

IV. BIBLIOMETRIC TOOLS

13. Bibliometrics is a basic tool of research used in the social sciences. It can be defined as the process of extracting measurable data through the statistical analysis of document contents, plus information about how the texts are being accessed and used by subsequent researchers. The use of bibliometric tools has a long history, and there are numerous journals that publish bibliometric research extensively, including *Scientometrics*, *Journal of Information Science*, and *Journal of the Association for Information Science and Technology*.

14. Citation analysis is one of the key constituent parts of bibliometrics. The usage of citation analysis on a significant scale can be traced back to the 1950s, although a few small studies predate this. In 1955, Eugene Garfield published an article in *Science*, outlining the basic concept of a citation index for scientific documents (Garfield, 1955). Garfield subsequently set up a company named the Institute of Scientific Information (ISI), which published the first Science Citation Index (SCI) in 1963. ISI is now part of ThomsonReuters, and the SCI is a major component of the widely-used Web of Science.

15. In his original paper, Garfield acknowledged that the idea of a science citation index was inspired in part by the well-established Shepard’s Citations in legal research. Shepard’s, which dates back to the 19th century, provides a list of all the authorities citing a particular legal case, statute, or authority, and can thus be used to trace their judicial history and find other relevant cases directed to a legal issue.

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