

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GAIN CAPITAL HOLDINGS, INC.,
Petitioner,

v.

OANDA CORPORATION,
Patent Owner.

Case No. CBM2020-00021, Patent No. 8,392,311

DECLARATION OF DR. MICHAEL STUMM

I, Dr. Michael Stumm, hereby declare:

1. I am a professor in the University of Toronto's Department of Electrical and Computer Engineering. I have published over 100 papers in top-tier conference proceedings and scientific journals.

2. My research interests lie in the general area of what in the computer science community is referred to as computer systems, particularly multiprocessor and distributed systems. One focus of my research and study is the design and engineering of distributed systems. I, along with the students in my research group at the university of Toronto, have built from scratch both computer operating systems, designed as distributed systems, as well as the hardware they run on, including 16-processor and 64-processor shared memory systems.

3. Generally, a distributed system is a type of computer system which amalgamates multiple computer systems together by locating various components of the system that are on different physical computers and which communicate with each other, for example by passing messages to each other. These different components interact with each other to achieve a common goal.

4. I am the inventor or co-inventor on at least eleven U.S. patents related to market and currency trading and telecommunications networks including U.S. Patent Nos. 7,146,336 ("336 Patent") and 8,392,311 ("311 Patent").

5. In 1996, I, along with Dr. Richard Olsen, launched OANDA, a company that provided the world's largest and most accurate database of currency prices at that time. OANDA soon became the gold standard for currency prices and interbank exchange rates online—relied upon by major corporations, national central banks, the United States Internal Revenue Service, auditing firms, and individual traders alike.

6. Although OANDA had made accurate exchange rates more available to the public, there remained a lack of viable platforms for individual retail traders to trade currency pairs (also known as foreign exchange, “forex,” or “FX”). At that time, to trade currency pairs, retail traders had limited options, each with their own drawbacks. First, retail traders could try to go through banks and currency dealers, but these charged consumers large spreads when trading currency, i.e., when the bid and ask prices are significantly far apart. And while some online trading platforms existed at that time, they suffered from a number of technical deficiencies. For example, due to the inefficient construction, traders could not see the prices of different currency pairs change dynamically—a user had to refresh their browser window to get new prices. In an attempt to address this shortcoming, some platforms constructed their web pages to automatically refresh once a minute, which would then show new prices. However, a browser refresh was (and still is) highly disruptive to the user. For example, if the user had scrolled down the page, they

would lose their place; and information the user had partially entered into forms (such as orders) could be lost. Additionally, automatic page refreshes more frequently than once a minute were prohibitively resource intensive for the trading platforms because, typically on a browser page refresh, the entire page had to be resent from the server to the browser, even though often the only thing that actually changed was the prices of the currency pairs. Additionally, retail systems before OANDA's could not support continuous monitoring of pending order positions (such as stop loss or take profit orders), with these often being updated only infrequently or overnight.

7. To make online currency trading systems more useful for retail customers, OANDA invented systems and methods for online currency trading that overcame these and other deficiencies of then-existing online currency trading technologies.

8. In 2000, I helped work on designing and building an online automated trading platform, through which OANDA could offer retail investors more favorable rates that banks used to trade currency among themselves. One way that we overcame the technical deficiencies inherent in prior art online implementations was through the use of a relatively new technology, Java. By creating and using carefully constructed client-server systems using Java applets (where some code executes on the user's computer (in the Web browser), and some code executes on the trading

platform server or servers) we could achieve second-by-second updates without costly whole page refreshes.

9. Notably, an online currency trading platform is neither merely a “computer” nor is it merely “software.” Rather, an online currency trading platform is a specialized type of distributed system, comprising (i) server hardware (including physical computer servers and databases in a datacenter), (ii) server software (including various programs that configure the computer servers and databases to do their jobs, cooperate, and communicate), (iii) networking equipment, (iv) client hardware (including customers’ desktop computers), and (iv) client software (including the Java code that runs on the customers’ desktop computers).

10. The design and assembly of the various components into a serviceable distributed system improved the functioning of the individual computers, both the server and consumer side machines, themselves. For example, a prior art trading platform server, like the ones discussed above, that served static pages (i.e., those requiring a refresh to see new prices) could only serve a small fraction of the number of customers that a dynamic trading platform server could service. Systems based on static pages relied on the server hardware to do all of the work necessary to update the client system with a new price. However, combining the client hardware with the server hardware into a distributed system reduced the amount of work that the

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