Submission to:
Patent Eligibility Jurisprudence Study

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I submit the below in response to the USPTO's request for information in connection with the Patent Eligibility Jurisprudence Study. My responses are provided just for the sections pertinent to my experiences.

Section I—Observations and Experiences:

1. Please explain how the current state of patent eligibility jurisprudence affects the conduct of business in your technology area(s). Please identify the technology area(s) in your response.

Background

I have been a serial entrepreneur and an independent inventor since 1981. I was a co-founder at five VC-backed Silicon Valley startups and the founding CEO at two. I have worked for dozens of startups, and all of them relied on patents as the fundamental protection that their investors looked for. I am a named inventor for 70 U.S. and 5 British patents, and some of those patents were the technical foundations for startups. I have also sold some of those patents to 5 different buyers in 6 transactions.

As an example, I founded Lightspeed Semiconductor in 1995 based on a chip architecture patent that I wrote and filed *pro se* in 1991 as the sole inventor, and paid for myself. LightSpeed eventually received a total of $95M in financing from VCs (USVP, Mohr-Davidow, Mayfield Fund) and investment banks (Goldman Sachs, Thomas Weisel Partners), and it grew to employ about 100 engineers.

Technology Areas

Technology areas where I have been involved with patents include: programmable chip architectures; semiconductor packaging; EDA software tools; smartphones; home systems; optical networking; MEMS devices; physical security; cyber security; video surveillance; PC accessories; E-Marketing tools; Internet search; virtual reality; location-based systems; online games; streaming media and media servers; and power grid controls.

How the Conduct of Business Is Affected

Unlike decades before, many patents in these technology areas are now software-based, and:

"***Software is the New Hardware***"

- In the 40s, we designed with tubes;
- In the 50s, we used transistors;
- In the 60s, we used simple integrated circuits;
- In the 70s, we entered the microcomputer age, microprocessors began proliferation, and the personal computer was born; and
- Eventually, software has become the new hardware in many aspects.

In other words, a large portion of the inventions that used to be hardware are now implemented through software-related innovations.

For software technologies, the current state of patent eligibility jurisprudence is effectively that of legal uncertainty. For smaller companies, startups, and individual inventors, it is questionable which software-related inventions will be legally deemed real (eligible) for patenting purposes, or questionable (ineligible) regardless of their uniqueness and practical applicability in the real world. This legal uncertainty also extends to whether their patents that are issued, ***after the USPTO declares them eligible***, will still be found ineligible and unenforceable by the federal court system.

Like all important issues, I understand that this is complex. For example, large companies will argue that the current state of patent eligibility jurisprudence probably helped curb abusive litigations by "patent trolls." However, I believe this was at the expense of smaller companies, startups, and individual inventors -- those who take the risks to start the new companies that grow large and expand our economy. For them, real and valuable software inventions are often lumped into the same category as questionable ones.

My understanding of the current state of the law is that many types of software inventions need to be drafted with particularity, such as claims for a specific algorithm or implementation, in order to have an improved eligibility certainty. However, it is often impractical to claim a software invention with such particularity while simultaneously being afforded the exclusionary right over the invention that the patent system is meant to provide. The nature of software inventions, especially for a "more innovative" invention that can change a previous paradigm, is such that a claim directed to a specific implementation can often be designed around easily. There can be numerous, if not countless, ways to implement such an invention. Thus, oftentimes, the only practical way to exclude others from practicing a real software invention is to claim the inventive concept in a broader manner, rather than particular implementations.

This puts into question whether a startup's software innovations would be afforded appropriate protection. This also affects a startup's ability to exclude others from practicing its inventions because it increases larger companies' incentive to copy the invention. Even when it was not a copying but an "accidental" infringement, when larger companies learn of their infringement of a patent, their incentive to take a license or stop infringing has decreased because the legal certainty associated with eligibility of any software patent has decreased.

This adversely affects a startup's investment opportunities and potential for growth because investors prefer startups to have ***enforceable*** patents to exclude others from doing what they have invented. Otherwise, their investments would be at risk because a big company is now able to do, at a much lower legal risk, what the startup has invented.

Further, larger companies are generally less affected by the current state of the eligibility jurisprudence than startups. A startup's innovation may often be all it has in order to receive investments and grow into a larger company, while larger companies generally have already mature products used by an already-established consumer base through already-developed sales/marketing channels.

2. Please explain what impacts, if any, you have experienced as a result of the current state of patent eligibility jurisprudence in the United States. Please include impacts on as many of the following areas as you can, identifying concrete examples and supporting facts when possible.

a. patent prosecution strategy and portfolio management

As a result of the 2014 "*Alice*" decision by the U.S. Supreme Court, patent prosecution has gone through great uncertainty. Initially, guidance at the USPTO was difficult to interpret for both examiners and applicants, with the result that most examiners seemed to automatically reject applications covering software technology. Fortunately, it seems that the USPTO has become more consistent in dealing with software patents and there's an improved predictability during prosecution. ***Unfortunately, success in prosecution does not provide any real protection for software inventions.***

The real issue is the uncertainty and inconsistency in how the federal court system applies the patent eligibility legal standards on patents that the USPTO has already allowed. And of course, that the eligibility standards applied by the federal court system seem to be in an unpredictable flux and ever-evolving adversely against software patents does not help. Thus, overcoming eligibility rejections during prosecution at the USPTO does not have much meaning in terms of being able to exercise one's patent right and protection from infringement.

As a result of this legal uncertainty, I am aware of applicants who resort to filing continuation applications just to keep a patent family alive in a desperate hope of future changes in patent eligibility jurisprudence. This is especially the case when the applicant filed the original application before *Alice*, so the claims will be limited to disclosures that were prepared in the pre-*Alice* environment and thus lack specific algorithms and implementations. Once prosecution is closed, future changes in patent eligibility jurisprudence will likely apply retroactively to patents that were prosecuted and issued prior to such changes. And because applicants are not provided with much legal certainty, some of them will choose to incur additional costs to file continuation applications that probably would not have been incurred if there was more certainty.

b. patent enforcement and litigation

I am aware of a situation where an inventor has a family of 8 software-based patents born out of a need to solve a serious problem. The earliest application was filed before the *Alice* decision, and the inventor did not have the benefit of drafting the specification based on eligibility guidelines stemming from *Alice*. Still, when the bulk of the prosecution at the USPTO occurred after the *Alice* decision and two of the applications received eligibility rejections based on *Alice*, he overcame both rejections. All applications in that family were allowed by the USPTO and issued.

Originally, this inventor had planned to start a company to sell a software product based on his invention. The inventor hired a developer, who built a working prototype, which was paid for out of the inventor's own pocket. However, before he was able to launch the business, a large company offered the patented feature and made his commercial efforts moot because he could not possibly compete against this large company.

Today, that same large company and others continue to use his patented invention prominently. One would think that the inventor would be able to actually exclude others from practicing his patented inventions given the 8 issued patents. After all, this was one of the main purposes of having the patent system in the first place. However, the current state of patent eligibility jurisprudence, especially in the federal court system, has cast a formidable cloud of uncertainty over software-based patents like his. Enforcement and litigation, including defending against IPRs, are extremely costly for small companies and individual inventors like him, and this uncertainty is preventing him from exercising his property right against infringers that have billions of dollars in resources.

Basically, the current state of patent eligibility jurisprudence has rendered the patent system prohibitively unpredictable for many of the smaller companies and inventors with software innovations. Consequently, it is unfairly skewed in favor of large companies at the expense of smaller ones with respect to their ability to even start enforcement.

It seems that independent inventors and small companies have little to no voice in this regard. For example, when stakeholders were invited to testify at the Senate Judiciary Committee hearings on "The State of Patent Eligibility in America" in June 2019, there was hardly any representation by the entrepreneurs who take the risks, and start the companies, that grow to employ thousands, and grow our economy. In the meantime, large companies have recently formed the "High Tech Inventors Alliance" (https://www.hightechinventors.com/) with a stated goal of achieving "Balanced Patent Policy." However, this is not an alliance of inventors. In fact, their "inventors" probably don't even know this is happening. It is mostly a consortium of very large companies formed to steer the patent system in their favor so that it will be easier to squash small companies and entrepreneurs whose patents they infringe.

I believe the scale of patent eligibility jurisprudence should be rebalanced so that it achieves its goal of weeding out questionable patents but with less downside against real inventions.

c. patent counseling and opinions

It seems that the only certain counseling and opinions with respect to the current state of patent eligibility jurisprudence are that it is very much uncertain. And given the legal uncertainties associated with the current state of patent eligibility jurisprudence, I imagine that smaller companies and individual inventors are more prone to receive advice against enforcing their software-related patents, which also decreases their incentive to file and prosecute new applications. On the other hand, I can imagine that larger companies are more prone to receive advice that assigns less risk to using a smaller company's software-related innovations without a license.

h. ability to obtain financing from investors or financial institutions

As explained above, investors expect technology startups to have patents, or at least patentable materials that form the basis for the startup's business. There are many examples of how entrepreneurs have been assisted in their financing endeavors by having unique and patentable technology. Many times, an entrepreneur has invested his/her own money and time in filing at least a provisional patent application before going to VCs. Other times, they describe unique and patentable material to their investors with an intention of filing a patent upon receiving funding. (Prior to 2013 we were operating under "First-to-Invent" and therefore it was more straightforward to disclose unique technology to investors during the fundraising process.)

There are many historical examples for this, and the following are a few examples of software companies where unique and patentable technology was part of their formation process. Interesting examples of software startups that became very large successful companies include:

- Twitter: Series A funding on 7/29/2007; First Patent Appl filed on 7/23/2007
- Facebook: Series A funding on 5/1/2005; First Patent Appl filed on 5/26/2004
- Crowdstrike: Series A funding on 2/23/2012; First Patent Appl filed on 6/8/2012

There are numerous references setting forth the importance of software patents when raising investments for startups, as well as startups that eventually became very large companies, employing tens of thousands:

- https://thepatentprofessor.com/three-software-apps-that-made-their-inventors-millions-using-patents-as-the-launchpad/
- http://blog.ipfolio.com/10-patents-that-launched-billion-dollar-empires
- https://www.ipwatchdog.com/2019/04/09/startups-with-patents-are-the-ultimate-anti-monopoly/id=108102/
- https://www.nber.org/papers/w23268
- https://www.morganlewis.com/-/media/files/publication/presentation/webinar/2019/final-preparing-for-a-series-a-investment-and-due-diligence.ashx
- https://milleripl.com/blogs/patents/what-do-investors-look-for-in-patents
- https://www.mbhb.com/intelligence/snippets/intellectual-property-and-the-venture-funded-startup
- https://www.patenteffect.com/post/how-patents-affect-vcs-funding-decisions
- https://www.uspto.gov/learning-and-resources/startup-resources
- https://www.nber.org/system/files/working_papers/w19191/w19191.pdf

As explained in my response to Section 1 above, the legal uncertainties associated with the current state of patent eligibility jurisprudence adversely affect a startup's investment opportunities and potential for growth.

m. innovation

At the heart of innovation in America are the entrepreneurs and visionaries who create new and unique products, and who start small companies that eventually become large. Today, most tech innovations involve software, and the current state of jurisprudence casts a large shadow on innovation and the ability to protect key inventions.

n. competition

The patent system is meant to provide a time-limited exclusionary right to inventors who come up with unique and valuable inventions in exchange for disclosing their inventions publicly. Providing this advantage was supposed to motivate more inventors to take the risks, in both time and cost, to create new products and start new companies. However, the legal uncertainties associated with the current state of patent eligibility jurisprudence lessens motivation to invent since the protection from competition is much less certain.

Section II—Impact of Subject Matter Eligibility on the General Marketplace

3. Please explain how the current state of patent eligibility jurisprudence in the United States impacts particular technological fields, including investment and innovation in any of the following technological areas:

b. artificial intelligence

Although artificial intelligence can often include hardware related functionalities like neural networks built with programmable logic chips, given the massive performance increases of processors and even systems with multiple parallel processors, many AI applications currently involve a heavy amount of software running on general purpose processors. As such, inventions claiming how the software operates are subject to uncertain eligibility standards, with the resultant rejections and in many cases the inability to protect unique AI inventions in the courts.

f. other computer-related inventions (e.g., software, business methods, computer security, databases and data structures, computer networking, and graphical user interfaces)

For my own work as well as my work with others, I have found frequent challenges with respect to eligibility for software functionality in the following technology areas:

- EDA software tools
- Cyber security
- E-Marketing tools
- Internet search

- Location-based systems
- Online games
- Business methods
- Streaming media
- Virtual Reality

Cyber Security

With respect to Cyber Security, I work with a startup company that has developed unique and powerful methods to uncover malware that will be extremely valuable -- both to corporations and the Nation as a whole. However, their US patent applications have been continually hit with *Alice* 101 rejections, and even though these have been typically overcome in prosecution, they cast a significant shadow over whether this company could defend their IP rights in the district courts. As we are all aware, the United States has a poor record with respect to cyber security, where reports of hacks and breaches seem to be in the news every week. It is truly a shame that innovative software technology to combat these attacks is not being accorded the IP rights it deserves. And, one result of this is that the motivation to invest further, or even create new startup companies in this domain, is greatly lessened.

11. Please identify how the current state of patent eligibility jurisprudence in the United States impacts the U.S. economy as a whole.

Since so many new and unique products are software based, the inability of an entrepreneur to protect his/her inventions will discourage some from starting new companies, thus eventually hurting the economy as a whole.

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In summary, I believe the U.S. Supreme Court did the U.S. economy a great disservice in 2014 with the "*Alice*" decision by creating uncertain and ambiguous standards with regards to eligibility. This uncertainty has helped large companies, but it was at the expense of small companies and individual entrepreneurs/inventors. And since the Supreme Court has refused to hear appeals directed to setting up a clearer standard for eligibility, it is up to Congress to address the problem by reforming the eligibility law.

And, when you next assemble stakeholders and "experts" to testify on this important topic, please include a substantial representation of startup entrepreneurs. I'm sure if you contact a few Silicon Valley VCs, they would be able to refer you to entrepreneurs at software startups where patent filings impacted the funding decision.

Sincerely,

Robert Osann, Jr.