BEFORE THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT ELIGIBILITY JURISPRUDENCE STUDY: PUBLIC COMMENT

Identification and Interest in the US Patent System:

I am an attorney registered to practice before the United States Patent and Trademark Office (USPTO). My undergraduate degree was chemistry with a minor in molecular biology and genetics. I am also a double board-certified physician with an MBA in finance. I served on active duty in the United States Air Force as a general medical officer and Flight Surgeon. I have consulted for teams seeking venture capital funding and have drafted Freedom to Operate opinions, Infringement opinions, and Patentability opinions.

Though I spent most of my professional life as an invasive/non-interventional cardiologist, I recently set out to use all of my resources to solve several seemingly intractable problems that have direct and dire consequences for my family, my friends, my neighbors, and my nation. I live in Toledo, Ohio and since 1995 Lake Erie—our source of drinking water—has been plagued by severe and worsening toxic algae blooms about which our respective governments have exactly NOTHING. As a physician it seemed increasingly pointless to treat diseases of affluence suffered by the few when far larger public health threats were destroying the lives of the many. I did a deep dive into the technical, scientific, business, financial, legal, regulatory, and social aspects of potential solutions to those large-scale problems. In the end, it all boiled down to money. It became crystal clear that securing patents would be essential to securing the needed financing.

Problems Requiring Patented Solutions

The blue-green algae secrete deadly hepatotoxins (e.g., microcystin which bioaccumulates and cause severe liver damage as well as promoting carcinogenesis) and neurotoxins (e.g., anatoxin and saxitoxin which cause severe neurodegenerative diseases). Water treatment does not completely remove the algal toxins and chlorination/ozonation produce highly mutagenic disinfectant byproducts. We, like most others in the world, suffer from petroleum-based plastics pollution. Our local zero-carbon nuclear power plants (i.e., Davis-Besse and Fermi) face premature retirement because they cannot compete economically with cheap fracked natural gas that does not assume the costs of its many negative externalities. We, like our fellow Americans, find our drinking water contaminated by poly- and perfluoroalkyl substances (PFAS: carcinogenic “forever chemicals”), endocrine disruptor chemicals (EDCs strongly linked to rising infertility), pesticides/herbicides (strongly linked to rapidly rising early onset dementia and cancers), hazardous carcinogens (e.g., benzene, toluene), and active metabolites of antiretroviral drugs (giving rise to accelerated RNA mutations).

Technical Aspects of the Solutions:

It is axiomatic in patent law that known elements can be combined to produce patentable novel, useful, nonobvious processes. It is also long recognized that new uses for known processes are patentable. Those facts are particularly useful when one faces a chicken-and-egg problem in seeking to create and finance massive, heretofore unknown solutions to very large-scale environmental problems. Only nuclear power plants can produce enough low-cost recoverable heat to cultivate sufficiently large algae/organism "crops" to clean phosphorus, nitrogen, and organic carbon from the shallow Western Basin of Lake Erie year-round thereby substantially removing the nutrients upon which the toxic algae thrive. Only nuclear power plants can produce enough low-cost recoverable heat to cultivate sufficiently large algae/organism cultivation to produce genetically engineered bioplastics at commercial scale.

The problem is that we do not own any nuclear power plants (nor would we want to given the enormous decommissioning and environmental remediation costs that come with ownership) with which to reduce our project to practice. We cannot get financing to control a nuclear power plant without patent protection for the investors. It is difficult enough to make prophetic patent claims for simple technologies, much less the complex technologies across several disciplines. This is where business method patents come in.

Business method patents claiming new combinations of old elements and new uses of known processes are patentable. As a patent attorney, I was well aware that business method patents for commercial viability of waste heat recovery and utilization of negative electricity prices during peak solar energy production (the "Duck Curve" dilemma of solar energy) would need explicit technical components to be patent eligible (as well as to satisfy the enablement and written description requirements). We were able to combine multiple disparate technologies across very different disciplines.

The biofuel industry provides the engineering and technology for large-scale algae/organism cultivation that will clean phosphorus, nitrogen, and organic carbon from water. Genetic engineering provides the science to produce valuable biomaterials from algae/organisms at high yield at commercial scale. Desalination utilizes recovered industrial and/or nuclear heat in addition to co-generated electricity. United States is one of the few nations with civilian nuclear energy that does not also employ heat exchangers to monetize the 65% of reactor heat not converted to electricity. Reactors in Pakistan and India have been economically retrofitted with heat exchangers to make use of otherwise wasted heat. Non-curtailment of solar energy leads to negative energy prices during a significant part of daylight hours. Chemical separation and purification technologies enable the harvesting of chemical contaminants from drinking water sources. Chemical decomposition and degradation technologies are well-known but are highly energy intensive (and not commercially viable unless one is able to find sources of relatively low-cost or negative cost energy).

<u>Non-Patent Problems:</u>

This is where this comment differs from any others the study committee will receive. This is constructive criticism meant to find solutions for problems not currently addressed during patent prosecution.

The international patent system of full disclosure only works if all of the players honor the intellectual property system. With all due respect, the Chinese exploit the openness of the West. The USPTO is a major fount of Open Source Intelligence (OSINT). We have sought to embody our technical disclosures in a part of the specification that is not readily apparent to a nation or nations that seek to expropriate our technology. We have also asked for non-publication of the application. We are happy to meet with the examiners at USPTO to demonstrate that our Business Method patent applications are backed by technical implementation.

Knowing that nuclear power plants are critical infrastructure, we have been very concerned about cybersecurity of our sensors and computerized control of the heat exchangers and the nuclear power plants from which we would recover the heat. We use the Business Method patents to claim the business methods while keeping the sensitive cybersecurity issues as trade secrets.

We also seek not to readily disclose our technological implementation in an effort to avoid hackers and ransomware.

We will apply for technical patents in the future as we develop those inventive concepts, but do not claim them now for fear that our disclosures—however incomplete and rudimentary now—might be used as prior art against us in the future. We do have massive, highly detailed technical and engineering plans and protocols in our business plan in order to deal with our investors, partners, and vendors, but that is different that be readily patentable. The Business Method patents are complete enough to claim in an effort to generate the financing egg that will lead to the massive environmental remediation chicken.

Summary:

We strongly urge Congress to continue to allow American inventors and entrepreneurs to utilize patently eligible Business Method patents that solve many problems that are not purely technical.

Respectfully submitted,
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