

The Limited Monopoly™

The Space-Time Innovation Continuum

by Robert Gunderman PE and John Hammond PE

Patent Law and its place in the Universe

This month, we are pleased to offer our 50th Limited Monopoly column. As a change of pace, we would like to expand your thoughts on how creative forces and innovation can affect space-time. Next month we will be back to patent law, but for now, we hope you will enjoy this diversion.

Innovation Based on Need

The true reason for most innovation is simply a need. Inventions frequently happen because an unsolved problem exists, and there is a need for a solution. This need may have different time requirements, as well as differing levels of motivation. An immediate need may be particularly effective at driving innovation, and the need to survive is likely the most effective need of all.

An example of this is taught by the history of Apollo 13. In this third Apollo mission, an oxygen tank rupture caused by defective wire insulation necessitated aborting the lunar landing. Because of the resulting damage, the crew of Apollo 13, supported by Mission Control engineers, was faced with a stark choice: innovate or die. During the return to earth, the crew shut down the Command Module and used the Lunar Module as a lifeboat. The Lunar Module had enough consumables (including oxygen) to sustain two people for two days. But the need – for the very survival of the crew – was to sustain three people for four days.

Rapid innovation under extreme pressure by the crew and the Mission Control engineers was needed for a safe return to earth. Modifications were made to the

“The crew of Apollo 13, supported by Mission Control engineers, was faced with a stark choice: innovate or die.”

Lunar Module systems, including a jury rigged device known as “the mailbox” that allowed the use of lithium hydroxide canisters originally designed only for the Command Module to remove carbon dioxide from the ambient atmosphere of the LM. Without this modification, the crew would have suffocated. Thus the most basic of immediate needs – survival – drove innovation.

they were both covered in burrs. Out of sheer curiosity he examined a burr with a microscope and observed the tiny loops that held the burrs so tenaciously to his pants. He then envisioned a fastener that would rival the zipper and knew right away there was a need for his invention. He initially was met with criticism and ridicule, but he persevered, knowing that there was an unmet need. His patented invention, and the company he would later form, has become a household word. He described his invention as “VELCRO®,” a combination of the words “velour” and “crochet.”

Innovation may also be visionary. A significant problem may be addressed through visionary problem solving, in which an inventor conceives of a solution, without providing a complete reduction to practice of his concept. Nonetheless, his concept is valuable, because those of us who are less visionary may build upon it. One of the most visionary inventors of all time was Leonardo da Vinci, who foresaw the helicopter, the military tank, the submarine, parachutes, advanced bridge designs, hang-gliders, and mechanical transmissions. He thought beyond the present day, and was truly one of the greatest engineers of all time.

Regardless of the different time requirements that may drive innovation, there must always be a need or a perceived or developing need in order to drive someone to invent or create a solution to a problem.



In other circumstances, a short term need drives innovation. Short term needs often manifest themselves in incremental improvements to a product, but may also be important needs that must be met without the luxury of much time. Medium and long term needs also drive innovation and often involve innovation by many participants who have a stake in solving the problem at hand.

Sometimes a need is not even evident until the ideas leading up to an invention are explored in some detail. The following is a familiar example. In 1948, Swiss engineer George de Mestral went hunting with his dog in the Alps. When he returned,

The Tendency to Invent Starts at a Young Age

Today's educational system does not do enough to create a sense of scientific and mathematical exploration and a mindset to use the things that a young person discovers to invent and solve problems. Children are truly a product of their upbringing and what they are exposed to at a young age. By exposing children to a variety of science oriented topics and letting them figure out how to apply what they have discovered in a creative and productive way, those children are taught valuable skills. Some have this tendency inherently, and many of them grow up to be engineers and scientists. Helping to stimulate and encourage this tendency will result in a society with more doers, more creators and builders – more innovators.

Invention as the Conversion of Thoughts to Matter

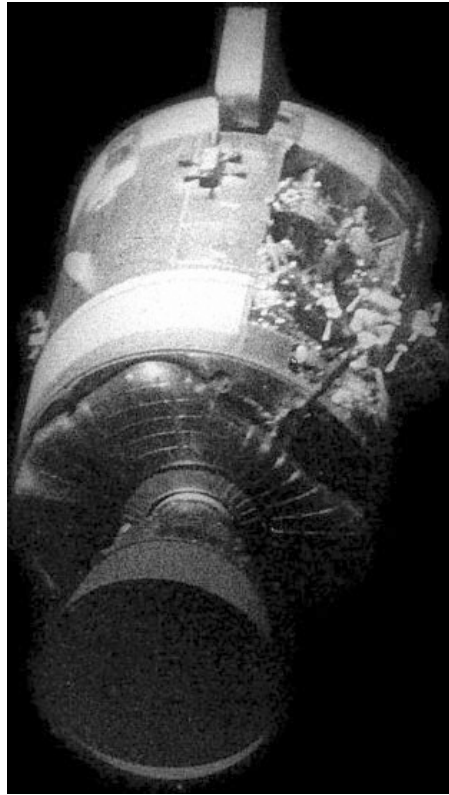
An invention is the conversion of a person's thoughts into a physical creation that solves a problem. As an invention is constructed, either via a physical or virtual prototype, or a complete paper design, that physical embodiment may be reflective of who the inventor is. For some inventors, this is a very powerful process that has a spiritual aspect unlike any other. This embodiment of a person's very being into his or her creation has been recognized for thousands of years in great engineering projects as well as great art and sculpture. Engineers can certainly relate to the deep inner satisfaction of thinking of a new design and then turning thoughts into reality. In a similar way, the creation of one person can be seen by others as a reflection and eternal reminder of that person.

Time Travel Through Creativity

The embodiment and representation of a person's thoughts in a physical creation, an invention, can span time unlike anything else. Great inventions and great works can span generations, essentially representing time travel of a person's spirit, their very being, their thoughts. Some individuals have a desire to serve mankind long after their physical bodies have left this world. They wish to create innovations that will benefit future generations, and in effect, travel through time with their thoughts and ideas. Many great inventors have done just that: Jonas Salk, Wilbur and Orville Wright, Nikola Tesla, Thomas Edison, Leonardo da Vinci, Marie Curie, Alexander Graham Bell, Galileo, Louis Pasteur, and others. All have taken the products of their mind and transformed them into physical creations that have benefited future generations. Their ideas and thoughts have traveled forward in time long after their physical bodies have left this world. This time travel through creativity is truly amazing and should be an inspiration to many young engineers as they enter their chosen profession.

Innovation as a Continuum

Innovation doesn't typically happen in one "eureka" moment as commonly believed. To the contrary, innovation requires discipline and hard work. Perhaps the initial idea happens



suddenly and unexpectedly, but turning that "flash of genius" into reality often takes time. Perseverance is critical. In the example of the invention of VELCRO®, it was not a fairy tale of a great idea turned into an overnight success, but rather, twenty years of hard work including trial and error, numerous prototypes, and near ruin. De Mestral was fond of repeating the quote that, "There are two paths of ruin for men: women and inventions, inventions being the more certain path." But he was obsessively determined, and ultimately prevailed in making his invention successful.

The Present Day Blanket of Technology That Stifles Innovation

So in the present day, how much of your time is spent innovating, inventing, creating, and otherwise converting your thoughts to matter? If you are like many, not very much time at all. With instant communications through voice, voicemail, email, text messaging, and the likes of Blackberries and iPhones, much of your day is probably spent communicating and

dealing with a glut of information. By the time you deal with all of this information excess, you have little time left for creativity. Moreover, creativity and innovation don't take root in a rapidly moving stream of disconnected information.

Clear Your Head

To truly be creative, you need to have the right environment – one in which you can spend time thinking without incessant interruptions. Where you find this oasis is up to you. It may be a quiet part of your office, a place in the woods to think and take notes, or perhaps a long run or bike ride where you clear your mind of clutter and focus on solving a problem, creating and building your thoughts and ideas one stride at a time. However you do it, getting away from your electronic devices to think free and creative thoughts is vital if you are to truly innovate.

Authors Robert D. Gunderman P.E. ([Patent Technologies, LLC www.patenttechnologies.com](http://www.patenttechnologies.com)) and John M. Hammond P.E. ([Patent Innovations, LLC www.patent-innovations.com](http://www.patent-innovations.com)) are both registered patent agents and licensed professional engineers. They offer several courses that qualify for PDH credits. More information can be found at www.patenteducation.com. Copyright 2010 John Hammond and Robert Gunderman, Jr.



Note: This short article is intended only to provide cursory background information, and is not intended to be legal advice. No client relationship with the authors is in any way established by this article.