2014

CHIPMAKER CHALLENGE

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PITCH YOUR PLAN. WIN A MACHINE

Finalist

Moore Engineering

Wade Moore

Connecticut

I always enjoyed working with tools since I was very young. It was a typical evolution of an American kid with his father's tools in his hands. Starting out with bicycles and then dirt bikes and then the ultimate teenage joy of working on my own car, in particular a supercharged 1991 Mustang. Except I had a special machine tool lineage in my family: my great grandfather founded the company Moore Special Tool, In Bridgeport CT, in 1924. He took manufacturing to the next level when he invented the Moore Jig Borer, he took precision to another decimal place, literally. Our company was world renowned for its incredible manufacturing of their Moore Jig Grinders and many accessories that they built all in house. When I was two years old, our company was bought out because of financial challenges, and my Grandfather's (then President) guiding principle to keep all of his 500 employees with their jobs. This loss was a big hit to my father, but he left the company with perseverance and mortgaged his house to save for the machine he was trained on to use, a #3 Moore Jig Grinder, where he supported our family, making parts with precision, down to forty millionths of an inch.

It was during my Mustang phase when I needed some precisely located holes to be drilled, some interfering metal to be removed, or a need for a custom bracket that brought me into contact with machine tools. I soon became fascinated with their capabilities to transform a rough and featureless pieces of metal into precision functional components. I also became fascinated with the power they gave me to bring to life mechanical concepts that were at one time just only thoughts and dreams in my mind.

This early experience I just described gave me the desire to seek, on a more formal level, an engineering education. This past May I was awarded a Bachelor of Science degree in mechanical engineering from the University of Connecticut (UConn). At UConn I was awarded third place in my class for our year-long senior design project. Our project was for Sikorsky aircraft, it consisted of nondestructive inspection methods for using adhesives to repair damaged helicopter skins, over conventionally used rivets. I also am an Eagle Scout and enjoy working well with teammates in scholastic projects, as well as projects in the workforce. I was a Material Science and Engineering intern at UTC Aerospace Systems in Danbury, CT for the summer of 2012. I worked with other engineers there, to inspect space craft parts and their processing of defects and prohibited materials that are unsafe for flight. All of these experiences have already benefited me in my business. My scoutmaster for Boy Scouts is my landlord and runs a machining business in the two bays next to mine. The Sikorsky engineers promised me work since my involvement in the senior design project at UCONN which had the most impressive display and ingenuity ever. Our team constructed a helicopter rotor blade assembly complete with a stepper motor powering the blades while statically fatiguing 1500 pounds cabled to it with the lap joint and adhesive which we had to demonstrate. Needless to say this incredible display garnered interest in my company.

Now with my recent education and the ability to take a more analytical approach to mechanical engineering challenges I am going to pursue my business,

Moore Engineering. I am going to run a precision machining shop with the guiding principles of my forefathers. While tackling subcontract work, I will also be developing my own concepts and inventions. There are a few concepts I am currently in process of developing. One concept I plan to pursue this year is what I always mentally labeled "Squirrel with a chainsaw". Now that could be the title of a low budget horror movie but that is not what it is about. It is about designing and developing tree trimming and tree cutting robots. I also have an active project of bringing to market a skateboard splashguard which I applied for and received a U.S. patent. Another project is designing a new way to manufacture specialty soaps.

I founded my company, Moore Engineering with the goal of taking my ideas to market. I have part-time employed my three younger brothers with the dream of having a strong family business like my great grandfather did. One brother is in the army and when he finishes his service contract he will be a great help. All my brothers will be a great component to the company once they are done with college like me. My brother Hayes recently graduated with an Advanced Manufacturing Certificate from a local community college that we are involved with in helping train their students. This is a great relationship to have since we were at the beginning stages of this new manufacturing center for Connecticut, and we plan to be instrumental in their success. We are proud that Connecticut is taking the steps to help manufacturing turn around and we plan to be one of the businesses that grows from their initiatives. I also aim to have our own products so that we can train the new graduates from the machining center at our company. I realized the benefits of having your own product from the successes of my Great-Grandfather's company. My company can be viewed at moore-engineering.com. The unique selling proposition for my company is that when you have tight tolerances and the hardest job to be done, you will come to my company and it will be done right the first time. I have access to the best talent there is in the world and I am very lucky that I have these key business relationships and people behind me. I have a great advantage being able to work and learn from my father and grandfather. I can spend hours on a Sunday morning at my grandfather's house down the block, where we talk about the book he wrote "Foundations of Mechanical Accuracy". In this beautifully illustrated book, he describes the whole process of making machines. It teaches basic, but intrinsic concepts like: flatness and roundness and how they are achieved in the real world. My dad has been a big influence on me. He is notably the best jig grinder operator I have ever met. He worked in every department at Moore Tool, and studied how his machine was built, he understands how his machine changes with thermal expansion and run out and is able to compensate for these changes. His precision with his old jig grinder is on par with brand new machines, and he is always teaching his customers the important practices of precision and measurement when they rely on their expensive measuring equipment.

What I also came to realize is that whatever you are creating: be it tree cutting robots, advanced surgical tools or the next super computer chip at some point it all starts in the tool shop, it all starts with machine tools. Hurco's CNC Lathe or Mill would be a great addition to our company because of its powerful manufacturing ability to handle non-production jobs, that are tedious to older lathes and mills. Hurco has employed state of the art processing technology to make the CAD, CAM and machining process rapid, this makes prototyping and one-time design jobs easy and profitable. I can see the effort that was put into the Hurco control to make it truly conversational and flexible to manufacturing needs. It will save me a lot of time and aggravation when I have to set up small lots of complex geometries. One of my customers is an organic farmer that makes soap and had great ideas that I helped her implement with my current machinery. I know that the Hurco mill will be the best addition to this process because of its uniquely adept control and capabilities to take all sorts of files to create manufacturing routines.

The greatest business challenge I face is funding for all my ideas. Each idea I have needs to have a patent so that it is protected once it comes into market. My small machine shop cannot compete with high production shops around the world. I have invested a lot of time and money into my first patent, which relates to fenders for skateboards and longboards. The manufacturing challenge I always have is to come up with the best manufacturing process and material for my idea. For example, for the skateboard fender: I have made prototypes out of milled aluminum, sheet metal, and a few plastic 3D print outs. Even though I have deemed injection molding to be the best process, I have to build the molds myself (which I could build with a VMX24i Hurco mill). It is challenging to find out which manufacturing process is best, and if a market exist for your invention to support the more expensive, but cost-effective manufacturing processes.

My company is going to have a huge advantage over other machine shops. This advantage is the high precision capabilities that were passed down through generations of practices. I have a great reputation from the hard work and respect that my father and grandfather accomplished. My dad's company is focused on the precision aspect of manufacturing, where we do the last finishing touches on aerospace parts. The new company I started is able to incorporate the whole manufacturing process. With the addition of a Hurco mill, we would be able to do the rough manufacturing as well as the high precision work at the end with our Fanuc EDM's and our world-renowned jig grinders. This will give our company a big niche.

I am currently involved with the Society of Mechanical Engineers and the American Society for Precision Engineers. It is through these societies that I keep in touch with other people who have embarked on the same livelihood that I have done. I also plan to have a newsletter about precision machining and write the

fourth book of the Moore heritage books on machining. Many people remember the Moore heritage of machining and I am working on preserving and maintaining that strong background.

I envision my company in 10 years, as a big brother to the small company it is now: an extremely efficient innovative company, where all of our work is done under one roof, and safety, cleanliness, and precision machining practices are employed constantly. It will be the place where young people go to apprentice themselves to the precision machining trade. It will be a business that will make my father, grandfather and great grandfather proud. I will strive to develop strong customer base that is diversified and constantly making sure past customers remain happy and new customers are thrilled to have us help them. It will also be the place where new ideas are developed, whether these ideas are my own, or those of other inventors who want to see their ideas become reality. I look forward to 2024, the 100th anniversary of my great grandfathers company, by then my company will be going strong with many Hurco machines under its roof.

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