A Long Journey to a Kinder Chisel
Roy Furchgott


Tyrone Turner for The New York Times
INNOVATION At Baltimore Toolworks, John Kluka shaping chisels. The company's owner, created a cap for chisels to make them safer to use.

IN the 1960s, when Downie McCarty was a teenager and his head was filled with the futuristic wonders of space age technology, he asked his father about his own future. "I used to say, 'Dad, how am I going to make a living making these old kinds of tools?' "
The young Mr. McCarty — Harry Downman McCarty, properly — was acknowledging his responsibility to the family business, a forge in Baltimore that his grandfather founded in 1925, primarily to make chisels and punches. His father tried to reassure Downie, saying, "There is always a need for basic tools."

The older Mr. McCarty was right about basic tools, but he could not have foreseen that his son, as the third-generation owner of the 25-employee Baltimore Toolworks, would confront the problem of how to compete with foreign companies that pay less for energy, materials and labor.

Gathering his years as a lacrosse star, time spent on an insurance claims review board and those rocket-ship daydreams, Downie McCarty, now 62, might have found an answer. He has improved the chisel, a tool seemingly immune to modernization.

He did it by wrapping it in a fiber-reinforced polymer sleeve that makes it safer to use and faster-cutting. The innovation may help Baltimore Toolworks survive another generation, if he can solve his marketing problem.

Updating the chisel fell off Mr. McCarty's agenda when he joined the family business in 1972, consumed by the demands of daily business. But in the 1980s, two problems returned Mr. McCarty to the idea of improving the chisel. The first was consolidation of hardware stores and distributors.

"Instead of 2,000 points of distribution, there were 500, then 200," Mr. McCarty said. Competition for those distributors drove down margins, and the distributors preferred companies that offered one-stop shopping for full lines of tools.

The second problem was the explosion in liability suits against toolmakers. Insurance companies stopped covering makers of hand-held hammer-struck tools.

The industry started its own offshore insurance company, and Mr. McCarty volunteered for the claims committee, where he reviewed accident reports. “That was the electric spark that bought back the idea,” he said.

The reports showed a pattern of injuries from the chisel. Smashed hands from missing the chisel with a hammer. Cuts from flying metal shards. Repetitive motion injuries from vibrations. Hearing loss from the high-pitched ringing of a struck tool.

Mr. McCarty thought he could cut down on these injuries by putting an easy-to-hit protective cap on the chisel. But what material could work best?

Here another strand fell into place. Mr. McCarty had been a lacrosse star, and at one time, he had been given prototype STX plastic lacrosse sticks to try. “Those sticks really were tough,” he said.

In 1992, STX gave him a molded plastic cap. To test it, he put the cap on a chisel, took it to an anvil and banged away. The prototype held up for 14 years, but it absorbed energy, which slowed down cutting.

He realized he needed help from a material scientist. Which led him to Dr. Peter Popper, a DuPont Company scientist who was about to retire and was ready for a challenge. “It seemed like a very difficult job to do, and I knew nothing about it, so I thought it might be fun,” Dr. Popper said.

Dr. Popper grasped the problem that any plastic cap that could survive a blow could not cut efficiently. “The question is, how do you design it, what material do you use, and do you reinforce it?” he said.

Proper design required scientific testing, which Baltimore Toolworks could not afford. But Dr. Popper knew that the University of Delaware matched engineering students with companies needing their expertise.

Toolworks needed to measure the effects of hammer blows on the plastic caps. In 2001, the students developed a computer-controlled hammer. With it, they could adjust the power of a strike, measure how much energy transferred and see whether the plastic would shatter.

By fall of 2003, a prototype, dubbed the Hard Cap, was ready for field testing. The computer hammer showed that the Hard Cap absorbed about 8 percent of the force of a blow, meaning it could cut through a quarter-inch metal rod in 12 strikes, compared with 11 for a standard chisel. But would that difference be too much for laborers?

James L. Glancey, a professional engineer who runs the University of Delaware’s senior design program, gave chisels to workers and observed them cutting bolts and rods. The workers cut faster using the Hard Cap.

The cap’s larger surface and better grip gave workers the confidence to hit the bolts and rods more forcefully than they would with a standard chisel. “So this actually outperformed the regular chisel at a 15 percent rate,” Mr. McCarty said.

A safer chisel that works faster should jump off the shelf. But not only does a hard cap add about 50 percent to the cost of a standard chisel — $9 to the regular chisel’s $6 — but a focus group also showed that when workers saw the plastic cap, they said, “It’s going to break the first time you hit it,” Mr. McCarty said.

Yet when they are used by workers, the tools are a hit. Handy, the magazine of the Handyman Club of America, distributed 935 chisels to members in three tests. Hard Cap scored 99 percent or above approval in the tests.

With a scant budget to overcome the misperception, Toolworks is exploring the possibility of licensing its technology, perhaps to another Baltimore tool company, Black & Decker. “If we can get a critical mass of knowledge this will be the leading product,” Mr. McCarty said.

Interestingly, the key to getting attention might be that problem of liability lawsuits. Damages in such cases often hinge on whether there was safer equipment available that the employer refused to provide. Some good chisel suits could make Hard Caps as common as hard hats.

Disponível em: <http://www.nytimes.com>. Acesso em 25/2/2008.