

Portrait of inventor T. Michael Shore, 73

“Still a Few Ideas to Push Through”

Seated at his desk stacked with rolling-mill drawings, proposals and notes, T. Michael Shore reflects on his career of more than half a century and the dozens of patents he holds. He also reveals his secret for coming up with great inventions.

How many mills have your ideas installed in them?

T. Michael Shore: I'd say 60 or 70. More than 50 alone have the Morgan Reducing/Sizing Mill, and a good number have the Morgan High Speed Laying Head. Some mills even have both technologies. At my age, I may be a rarity in the field, but I still have a few ideas to push through.

“Use your brain to its maximum ability and know what is out in the market.”

Have you ever had an idea that wasn't patented?

Shore: Oh yes, plenty. Maybe 20 or 30 were not considered worthwhile to pursue. When you've started more than 50 rolling mills, you see opportunities for improvement every day. You may find solutions and not be able to take out a patent every time. Or you might try something and then tell yourself, “I won't do that again.” Either way, you learn something new.

One European mill had a recurring problem in the 1960s with roll breakages. I thought of a possible solution, but in an era of telexes and with little access to long-distance calls, it would take weeks to get it approved back in Worcester. So I worked together with the mill manager and came up with a solution. The customer thought it was great, patented the idea and immediately put it into practice, which was my goal all along. Morgan liked it too, and promptly bought the patent from the customer.

What's the secret to coming up with a great invention?

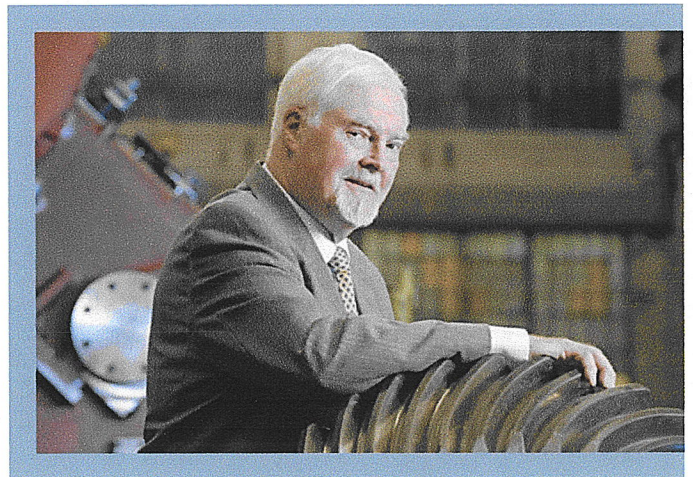
Shore: It's difficult to explain, but probably a combination of using your brain to its maximum ability and knowing what is out in the market. With those talents and resources you can recognize what can be improved. I also draw on my practical experience

from years of commissioning mills. I was shoveling snow when I came up with the idea for MORSHOR. I'd been playing around with many ideas in the office, but outside I had the freedom to think. That and the cold air opened my mind to new ideas.

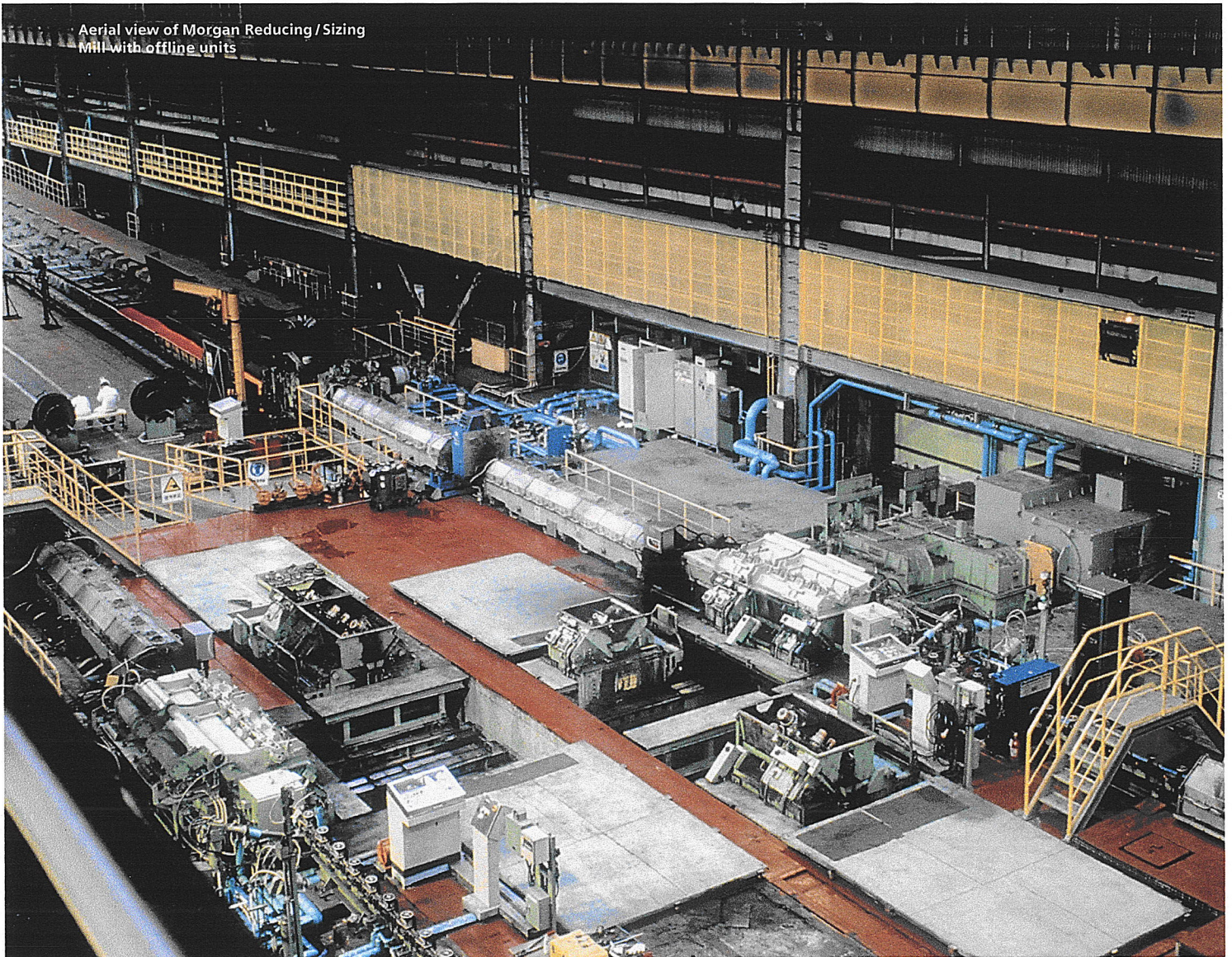
Who do you credit as your mentor?

Shore: When I first started at Morgan I visited many mills with Eric Fors, a Swedish-American director and senior vice president of Morgan who served as my tutor. We would visit mills together and discuss what we saw there. He would explain to me what the problems were and what needed to be done to solve them. He shared his philosophy with me by asking constantly, “Don't you think we should be doing something differently here?” He was a very instructive man. ■

Author
Allison Chisolm
Contact
longrolling.metals@siemens.com



Aerial view of Morgan Reducing / Sizing Mill with offline units



“When you’ve started more than 50 rolling mills, you see opportunities for improvement every day.”

Back in 1960, T. Michael Shore co-authored an industry research report on rolling-mill technology. That report caught the attention of managers at Morgan Construction Company, now Siemens VAI, and led to Shore’s recruitment for the Manchester, U.K., office. He has been looking for ways to improve rolling mills ever since, drawing upon his virtually encyclopedic knowledge gained

firsthand during the 28 years he spent in the field commissioning mills. Shore calls 61 inventions his own and more than 600 bear his name worldwide, many shared jointly with his colleagues. Undoubtedly, his inventions have raised industry standards. Last November, Shore was one of 12 innovators honored by Siemens as Inventors of the Year.

T. Michael Shore's Most Significant Inventions

Morgan Reducing/Sizing Mill

In the early 1990s, a customer wanted to produce multiple sizes of rods without adding additional strands to its rolling mill. Shore's solution sketched out the initial idea for the Morgan Reducing/Sizing Mill. Patented in 1994, this invention revolutionized rolling mills by allowing "single family rolling," or the ability to produce a variety of rod sizes from a single set of grooves through many stands of the mill. Steel can flow from the furnace to finished rod product with diameters ranging from the new smallest 4.5 mm size up to 25 mm. Rod tolerances are also far tighter than previous mills could guarantee, within 0.1 mm with an ovality of 0.1 mm, which reduces wire-drawing die wear and material losses in making finished products.

The innovation also allows customers to expand their product range through thermomechanical rolling (TMR), which produces a fine-grain product of higher metallurgical quality, and can reduce required after-processing work. With lower quality products, downstream annealing could take an additional twenty-four hours. TMR can save six to eight hours in annealing time, or for certain products, eliminate it altogether for significant cost savings. The Morgan Bar Reducing/Sizing Mill is an offshoot of this first invention.

Morgan High Speed Laying Head

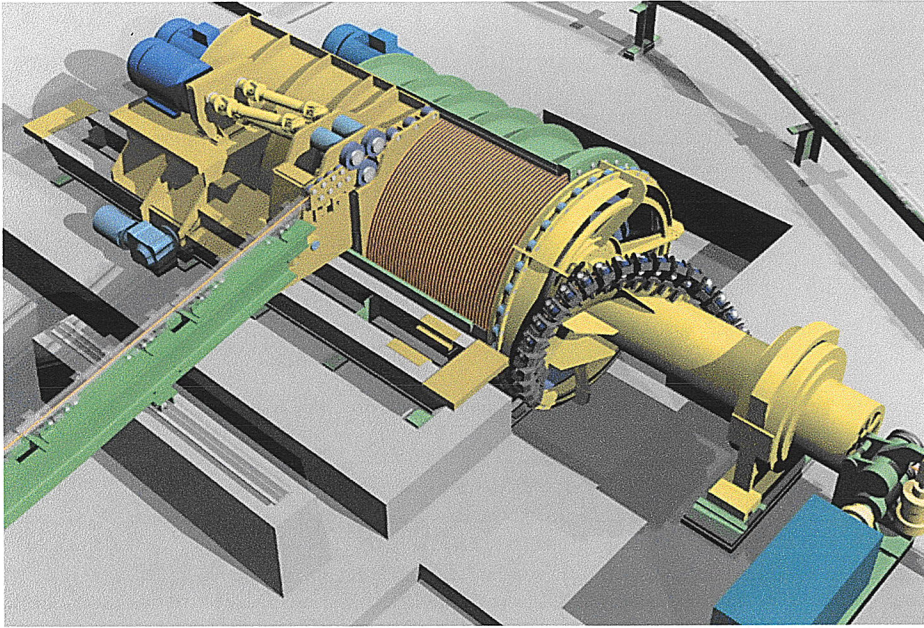
When a mill's speed increases, it becomes harder to manage the ends of the rods moving at 120 meters per second, which roughly translates into 400 km per hour or the speed of aircraft at liftoff. The rod is coiled for handling and transport, and the Morgan High Speed Laying Head provides a way to keep the first and last rings of a coil in the proper shape. The key to Shore's invention is the way it guides the head and tail rings so that even with rods blasting into the laying head at 120 m/s, it can produce 30 rings per second without deformity.

MORSHOR

Titled "Method and Apparatus for Decelerating and Temporarily Accumulating a Hot Rolled Product," this invention allows long rolling mills to significantly increase production rates on small-diameter products. The only Siemens VAI product to include the inventor's name, MORSHOR enables rolling mills to double their production of small diameter (5.5 mm) rods, usually a size with high market demand, and improve mill utilization on larger sizes. Since the maximum finishing speed limits the production of the small-diameter products, the drum-like storage unit of one MORSHOR can accumulate a billet at, for example, 150 tons per hour and feed one finishing block at 75 tons per hour. A second MORSHOR can take the next billet at the higher rate and feed a second finishing block at 75 tons per hour as well, therefore efficiently maximizing the mill's designed capacity of 150 tons per hour. MORSHOR has been tested and the first sale of this innovation is expected this year.

Morgan Modular No-Twist Mill

Shore has several patents on this invention, the latest pending one together with his son, Mark. The Morgan Modular No-Twist Mill increases the efficiency of today's rolling mill. Like the Morgan Reducing/Sizing Mill, individual segments of this finishing mill can move on and off the production line to reduce downtime. All programming changes can be done offline on spare units, setting the guides and rolls for new sizes, so that once it moves into place, production can resume immediately. Maintenance is also far simpler, as it can be performed offline on the modular unit while the mill continues running.



The MORSHOR system increases production rates on small-diameter products

Morgan High Speed Laying Head with tail end control

