

da Vinci Decoder

St. Paul inventor Mark Rosheim recreates lost robots of the Renaissance
BY FRANK JOSSI

THE ITALIAN RENAISSANCE GENIUS Leonardo da Vinci and a modern-day gym may not seem to have much in common at first glance. But a few years ago, while pulling weights on a Cybex machine at the St. Paul Jewish Community Center, da Vinci aficionado Mark Rosheim had a eureka moment. Rosheim had for years been attempting to build a replica of the "robot knight," a famous amusement da Vinci is said to have constructed around the time he painted *The Last Supper*. The Cybex's unique pulley-and-weight system gave the St. Paul man a sudden insight in his quest—some would say obsession—to understand and build da Vinci's mechanical creations.

Da Vinci's surviving drawings did not indicate how the robot knight moved. Rosheim's hypothesis, now widely accepted, centered on a pulley system. "Most people thinking about these issues concerning da Vinci probably have their great insights in London or Florence," he says, with a laugh. "Mine came at a health club in St. Paul."

An engineer, inventor, and writer, Rosheim works on robotic projects for NASA and private industry as well as the Italian master's "lost robots." His quest to unravel a da Vinci code of a different sort by studying and recreating the artist's inventions has garnered international acclaim.

The robot knight—which can sit, stand, raise its visor, and move its arms—has been featured on the BBC and the History Channel. It even makes a brief appearance in Dan Brown's novel *The da Vinci Code* in a few sentences Rosheim claims were lifted almost word-for-word from a paper he wrote.

Da Vinci left thousands of pages of inventions and drawings, only about one-third of which survived in the form of "codices," or scrapbooks. Some of his designs anticipated innovations that came hundreds of years later—military tanks, scuba diving equipment, helicopters, and other flying machines.

Rosheim's Highland Park home attests to his fascination with da Vinci. The living room contains two large cabinets filled with hand-bound volumes of codices. The basement, meanwhile, serves as a workshop for the inventions Rosheim develops for various clients through his company, Ross-Hime Designs.

Rosheim has worked with University of California—Los Angeles art history professor Carlo Pedretti to realize the robotic inventions. With Pedretti's help, Rosheim crafted a groundbreaking programmable "cart" that da Vinci may have used as the base for a mechanical lion. He was also able to reconstruct a mechanical clock with a bell ringer powered by an elaborate hydraulic system.

This spring, Rosheim spent much of his time working on a robotic project with military applications and promoting his new book, *Leonardo's Lost Robots*. Several of his own robots, as well as a few da Vinci recreations, are on display at the Museum of Science and Industry in Chicago. "Da Vinci did it all," he says. "He did painting, sculpture, architecture, drawing, and writing. He was the quintessential Renaissance man. His inventions still resonate with us today." ■

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