

# A robot That Ties The Knot

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An ASME member and retired engineer who once designed biomedical instruments is busy in his basement building a machine that can automatically tie a knot in a necktie. Dr. Seth Goldstein, who has worked as a mechanical engineer for 40 years, will complete the robotic device this summer for display at the Franklin Institute in Philadelphia. There, the job of Why Knot will be to inspire the analytical and creative abilities of young men and women and raise awareness of mechanical engineering as a career choice.

"As a kid, I took the tour of the factory in Hershey, Pennsylvania, and was astonished with the automated process of wrapping the paper around the chocolate bars," explained Goldstein, who attended Massachusetts Institute of Technology and was a founder of the Bioengineering Division at ASME. "I believe Why Knot can inspire people in the same way and instill in them the desire to conceive and create."

Visitors who walk past Why Knot will activate a sensor that automatically starts the machine. Why Knot is a kinetic sculpture machine that consists of electric motors that send power to pulleys, levers, and other mechanical components, which grasp, pull, and manipulate the necktie to secure a standard four-in-hand knot. The device also unties the knot. Goldstein and a friend wrote a computer program that provides the automated and sequential control of the DC motors. All the electrical and mechanical components of Why Knot are contained in a 2' by 3' footprint.

The machine that Goldstein is readying for exhibition at the Franklin

Institute is a more robust model of an earlier version that took the inventor 2 ½ years to build in his spare time at night and on weekends. Goldstein is designing increased intelligence as well as a self-correcting function into the second-generation Why Knot.

This year, ASME is celebrating its 125th anniversary. The founding of ASME in 1880 is intertwined with the early history of the Franklin Institute, which during the middle and late 19th century was a prime vehicle for disseminating information about mechanical engineering.

ASME continues to sponsor educational and public awareness programs aimed to inspire young people towards careers in mechanical engineering and technology.

Why Knot will be a permanent exhibit in the newly renovated Mechanics Hall at Franklin. "I hope it's a real attention-getter," said Goldstein. The ASME Foundation has provided \$30,000 for the project.

Goldstein holds 12 patents for inventions in the areas of pneumatics, instrumentation, medical devices, and microscopy. He is the former head of the mechanical engineering section at the National Institute of Health. He is a Fellow of ASME.

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