

Interactive Machines



Jacques de Vaucanson (1709-1782)

Vaucanson Metal Lathe

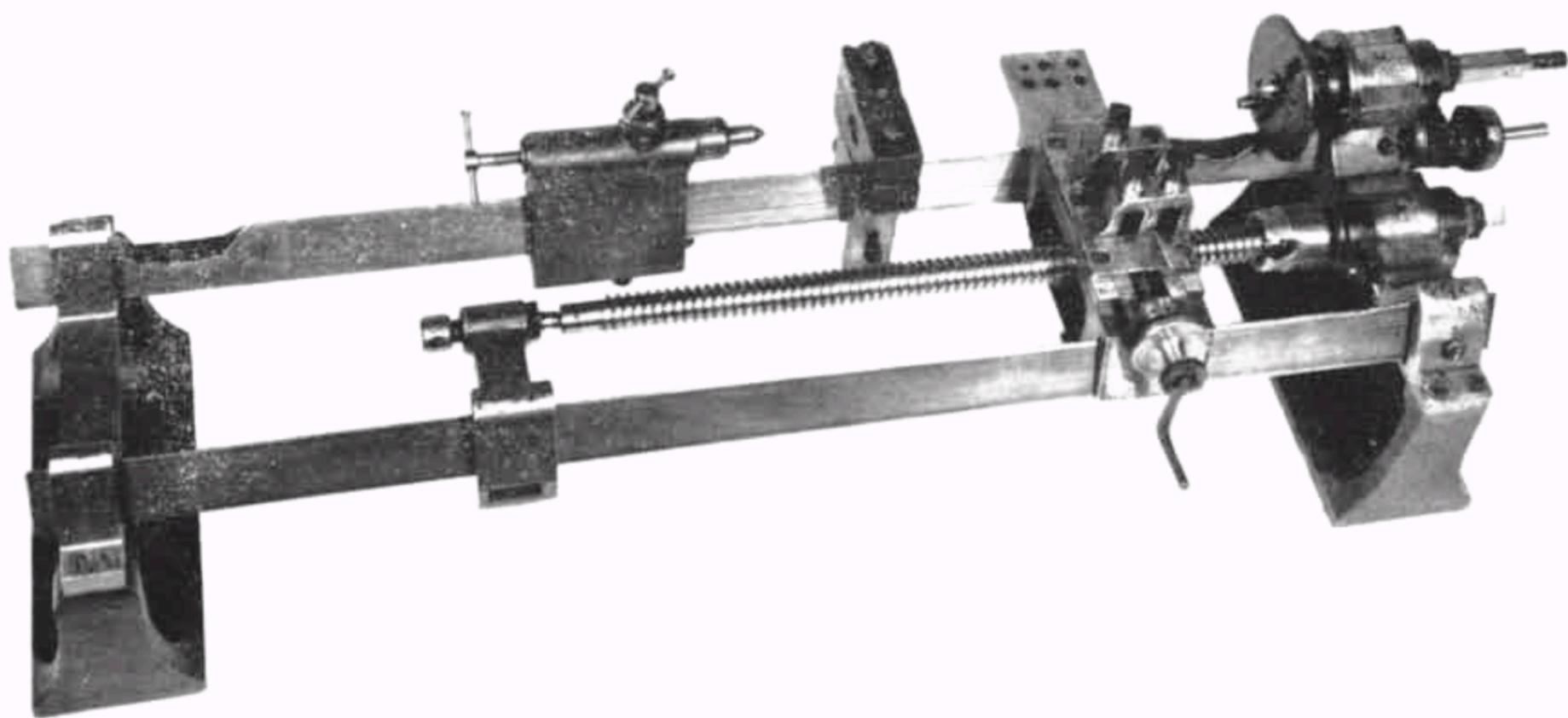


The 1751 Machine that Made Everything

Machine Tool

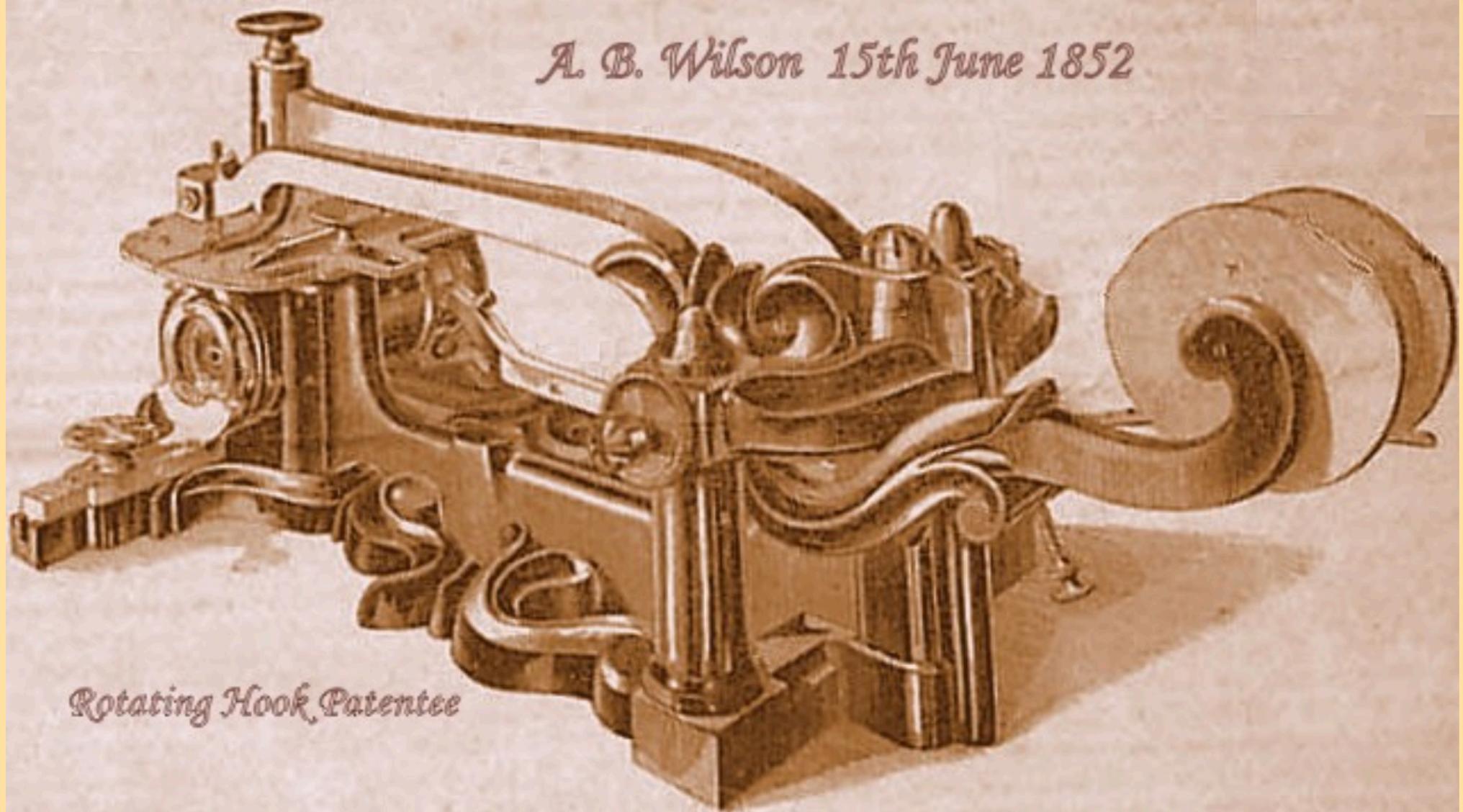
"Many historians of technology consider that true machine tools were born when the toolpath first became guided by the machine itself in some way, at least to some extent, so that direct, freehand human guidance of the toolpath (with hands, feet, or mouth) was no longer the only guidance used in the cutting or forming process. "



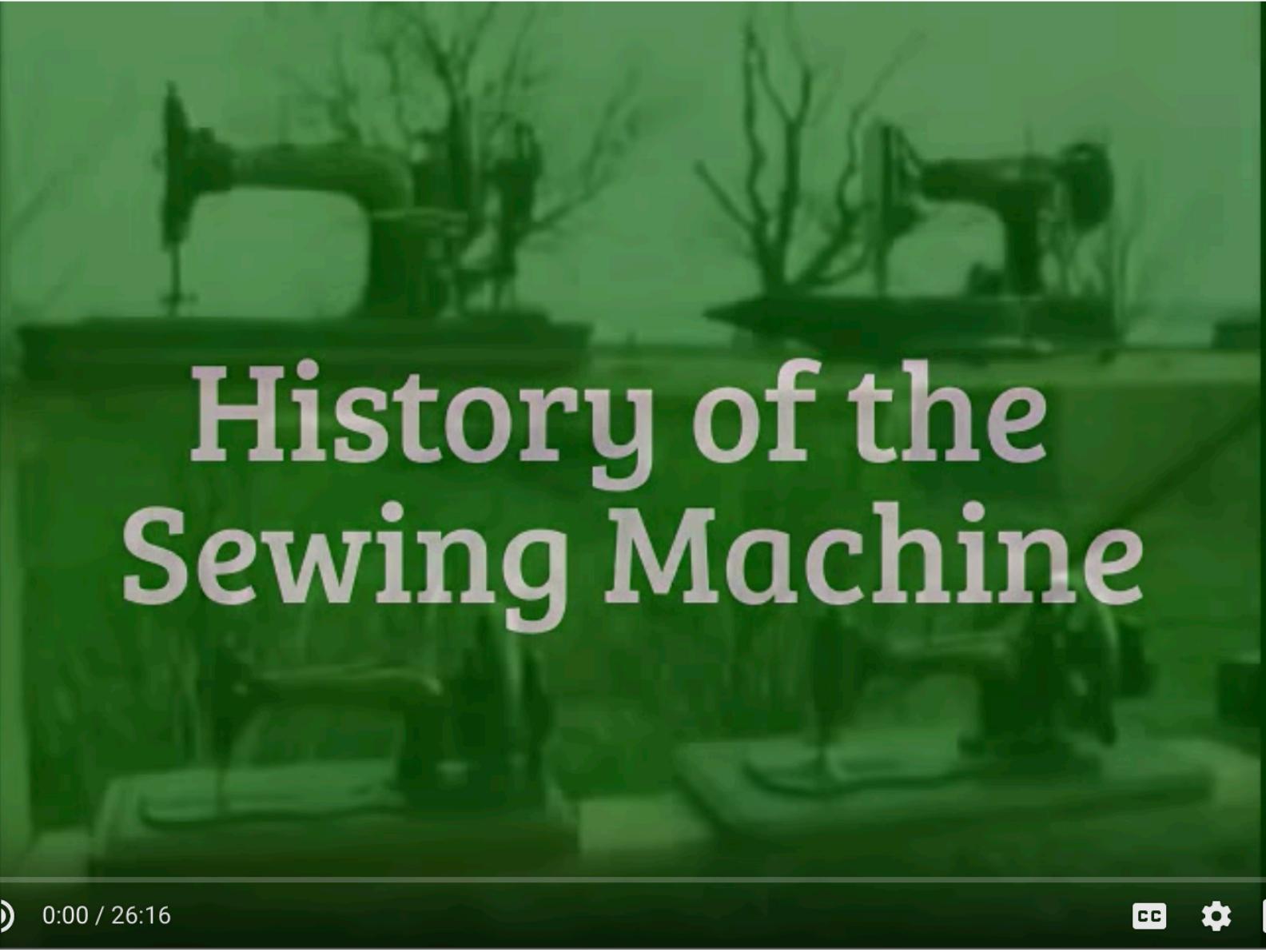


The Improved Sewing Lathe

A. B. Wilson 15th June 1852



Rotating Hook Patentee



History of the Sewing Machine



subscribe



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Innovations

Lockstitch instead of the chain stitch

Needle with groove

Tensioning arm

Bobbin, shuttle, and rotary hook

Feed mechanism (four motion, walking feet)

Foot treadle freed your hands (eventually motors)

Zig-Zag stitch using a cam

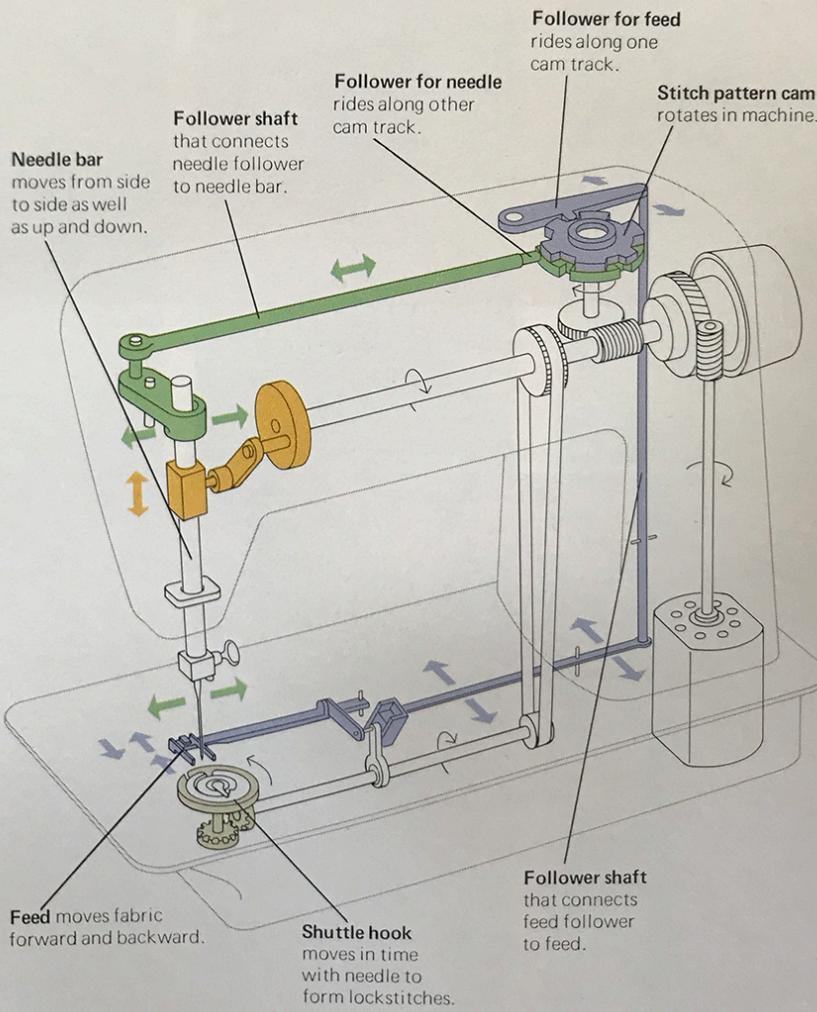
Automatic threader

machine

From Readers Digest Complete Guide to Sewing

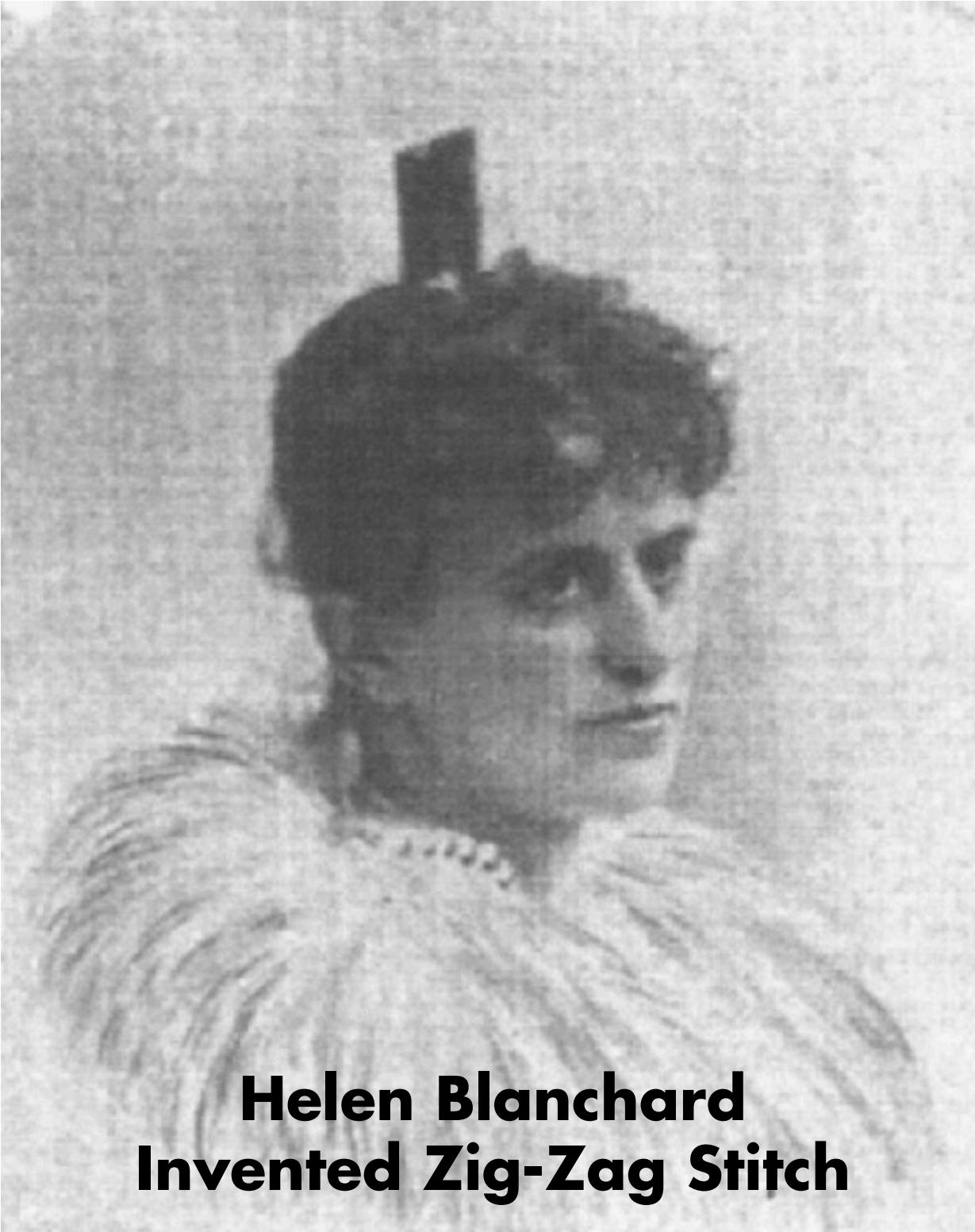
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just the foot
on pages 28-29.

Stretch stitches are produced basically as shown in the diagram. As two-track **cam** rotates, a **follower**, connected to the **needle bar**, rides along one track to move the **needle bar** from side to side. Another follower, connected to the **feed**, simultaneously rides the other cam track to move the feed for forward and reverse stitches as required by the design. **Stitch pattern selector** positions followers onto appropriate cam tracks; **stitch width regulator** determines the maximum width of the pattern; **stitch length regulator** controls the stitch length. As these actions are taking place, the needle bar is moving up and down in time with the shuttle hook to form lockstitches between the top and bottom threads.



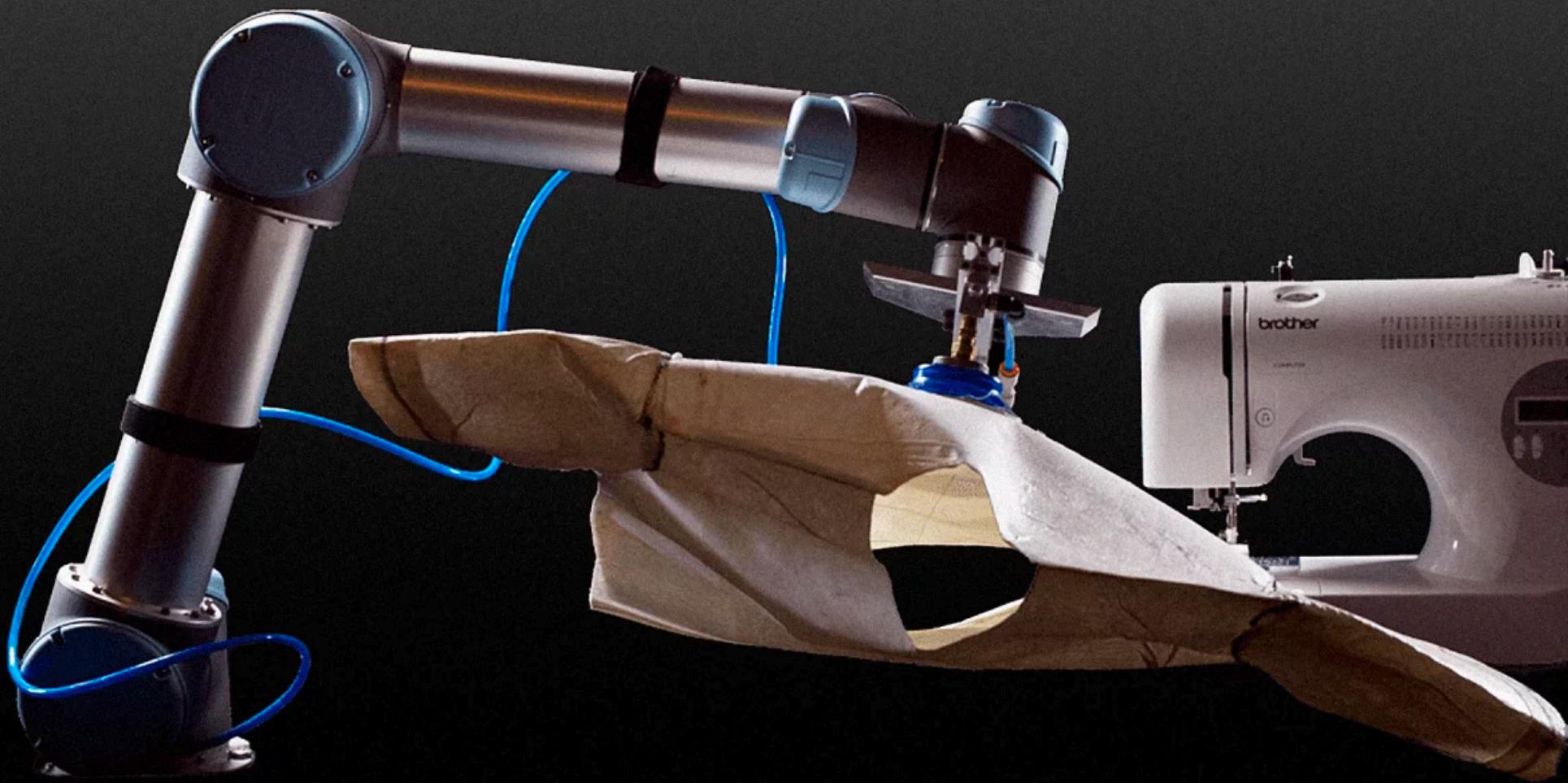
A typical stretch stitch has a left, forward stroke and a right, backward stroke. Unlike a zigzag, it has a definite width and a definite length.

A pattern



**Helen Blanchard
Invented Zig-Zag Stitch**





<http://www.sewbo.com/>



The Invention of the Sewing Machine

Grace Rogers Cooper

Premise: People want to be involved in the making process - not just push a button and run a machine

Challenges:

- How would you allow for design/improvisation during the making process?**
- How to design the interaction between people and the machines?**

Smart Tools

The wise chisel



Black & Decker Gyro BDCS40G

A close-up photograph of a person's hand holding a compass. The compass is being used to draw a circle on a piece of paper. A bright green light is visible from the center of the compass hub, illuminating the paper. The hand is steady, and the compass arm is extended.

COMP*PASS

Augmenting a Compass to Enable Drawing
and Duplicating Various Figures on Physical Papers

Keio University
Ken Nakagaki and Yasuaki Kakehi

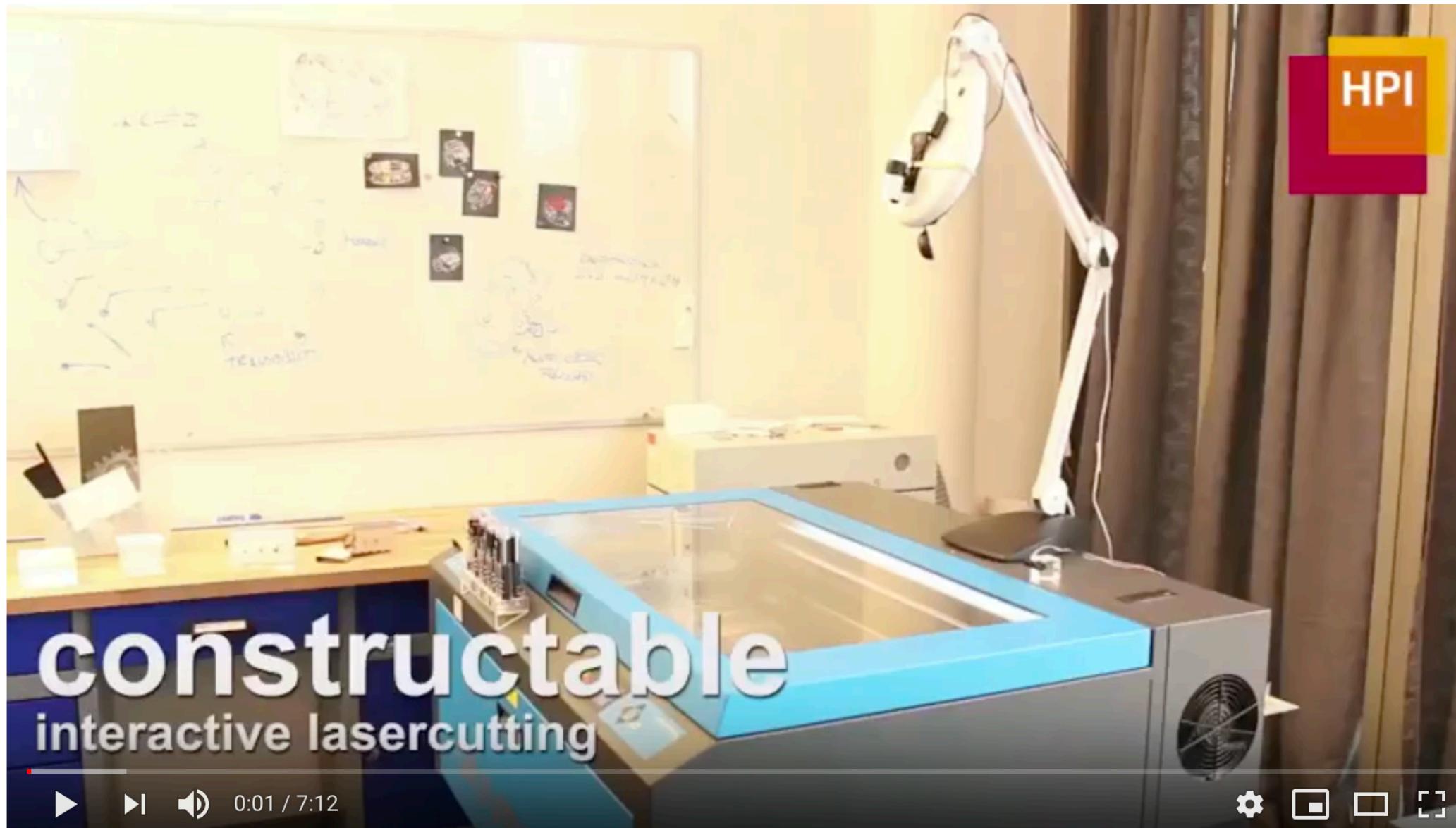


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constructable
interactive lasercutting

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<https://dl.acm.org/citation.cfm?id=2380191>

The Advantages of CAD

Precision

Fast interaction

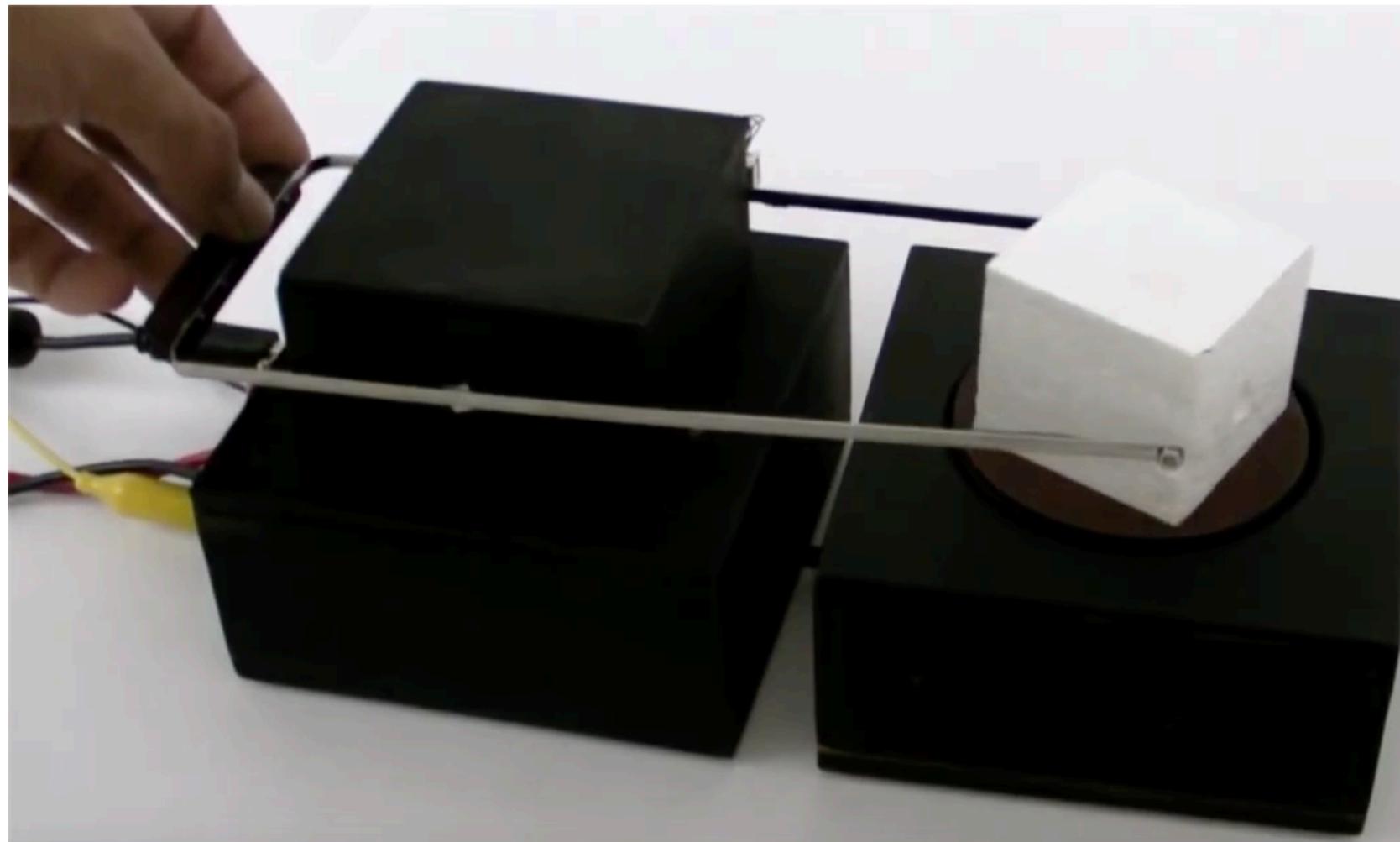
Trial and error (undo and redo), modify

Documentation

Invent new ways to create drawings other than by making, e.g. parametric design, generative modeling

Design space exploration using simulation

Interactive fabrication: new interfaces for digital fabrication



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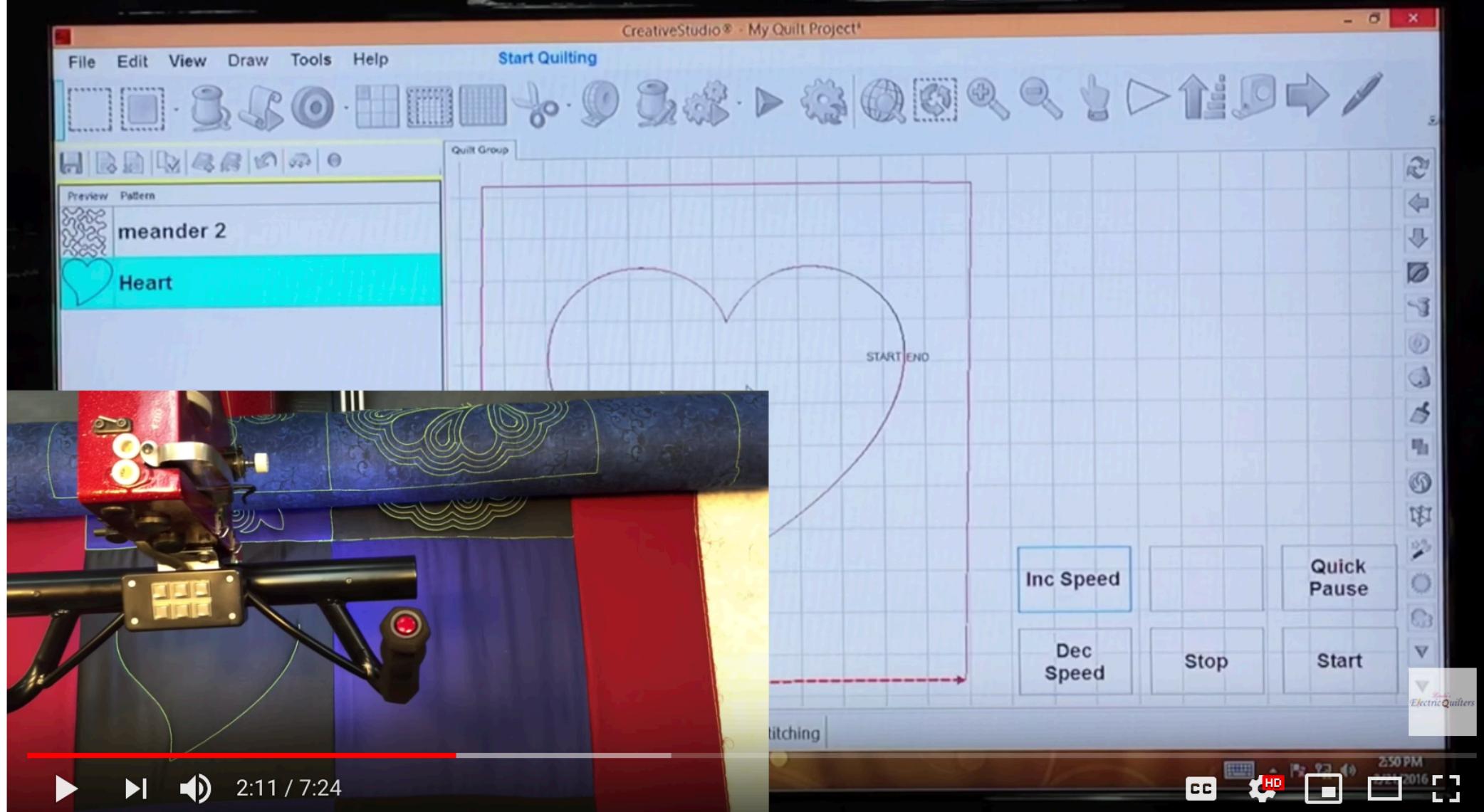


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Interactive?

Embroidery Machine Paper Cutter Plotter



Back to the Basics- Fill Inside & Outside
Linda Electric Quilters