

Weaving Through the Ages

A SHORT HISTORY OF WEAVING
AND HOW IT INFORMED
THE CREATION OF
EVERYTHING FROM CLOTH
TO THE COMPUTER.

BY LIZ GIPSON



Weaving has occupied the human experience since practically the dawn of human existence. There is no known record of the first weaver, or why she decided to weave. Perhaps she observed birds making nests or spiders weaving webs, and decided to mimic the patterns she observed in nature, making a basket to carry food from one place to another by gathering and interlacing reeds.

The first physical evidence of woven cloth was found in a burial ground associated with the ancient Greek colony of Pantikapaion, now the modern-day city of Kerch in the Ukraine. It is believed that these fragments date back to the fourth millennium B.C.

Ancient mythology abounds with references to weavers and their cloth. Spider Woman — not the Marvel comic book character, but the Navajo deity considered the original spiritual weaving teacher — is said to have provided the thread that drew the Diné, or Navajo, from the third world to the fourth, the world of time and physical being. Scholars believe that the Navajo people learned to weave from the Puebloans sometime in the 16th century.

In Greek mythology, the peasant Arachne believed she could weave better than the gods.

Athena, the weaver among the gods, was offended by Arachne's boasting, challenged her to a weave-off — and lost. Athena humiliated Arachne and drove her to take her life, but later, showing remorse for her behavior, she revived Arachne and changed her into a spider.

Some of the earliest documented accounts trace the origin of ceremonial Kente weaving to early traditions in the West African kingdoms that thrived between A.D. 300 and 1600. The Ashanti, who live in what is now Ghana in West Africa, are known for their mastery of this colorful, strip-woven cloth. According to legend, the first man to weave — it was mostly men who wove for centuries — learned the art by watching a spider at work.

Weaving as Necessity

Throughout history, most people knew how to weave. In fact, until the Industrial Revolution — the great divider between the time when we knew how stuff was made and modern times, when most don't have a clue — people made their own clothes, or at least participated in some way in making them (buying the cloth from a weaver, taking it to a seamstress,

Protection FOR THE INDUSTRIOUS Weavers.

INFORMATION having been received that a great number of industrious Weavers have been deterred by threats and acts of violence from the pursuit of their lawful occupations, and that in many instances their Shuttles have been taken, and their Materials damaged by persons acting under the existing Combinations:

Notice is hereby Given,

That every Protection will be afforded to persons so injured, upon giving Information to the Constables of Stockport: And a Reward of

FIFTY GUINEAS

Will be paid, on conviction, to the person who will come forward with such evidence as may be the means of convicting any one or more of the offences mentioned in the Act of Parliament, of which an Extract is subjoined: And a Reward of

TWENTY GUINEAS

Will be paid, on conviction, to the person who will come forward and inform of any person being guilty of assaulting or molesting industrious and honest Weavers, so as to prevent them from taking out or bringing in their Work peaceably.

PETER BROWN, {TOWN-CLERK.
T. CARTWRIGHT, }

Stockport, June 17th, 1808.

By the 22nd, Geo. 3, C. 40, S. 3.

It is enacted, "That if any person enter, by force, into any House or Shop, with intent to Cut and Destroy any Loom or Cotton, or Loom and Cotton, mixed with any other Materials, in the Loom, or any Warp or Shuttle, Treadle, Twill, and Utensils, or shall Cut or Destroy the same, or shall Break and Destroy any Treadle, Twill, or Utensils, for Weaving, Preparing, or Making any such Manufactures, every such Offender shall be guilty of FELONY, without Benefit of Clergy."



OPPOSITE: In legend, the spider taught African weavers, who today create brilliant Kente cloth. **LEFT:** English police offered rewards to catch rebellious Luddites. **TOP:** Gandhi's wife taught him to spin. He encouraged Indians to weave rather than buy British cloth. **ABOVE:** Inventor William B. Stout drives the first fiberglass car.

Photography by (clockwise from left): The Granger Collection, Getty Images, Corbis

raising sheep, working in cotton fields), not just as a fashion statement but as necessity.

In the early 1800s, a group of weavers near Nottingham, England, did not take kindly to the changes wrought by the Industrial Revolution. With the introduction of mechanization, weavers who formerly worked as independent contractors were driven out of business or forced to work in factories. A guerrilla army of resisters started breaking into factories or using internal sabotage to destroy the mechanized looms. They became known as Luddites, a term we use today to label those who resist technological progress.

Many other expressions also have their roots in woven cloth. For example, before red tape meant bureaucracy, it referred to the handwoven tape, made on small looms and dyed red, that bound official documents from the crown. Revolting against the crown's red tape, both American colonists, and 150 years later native Indians led by Gandhi, refused to buy British cloth that was heavily taxed and instead made their own homespun clothes.

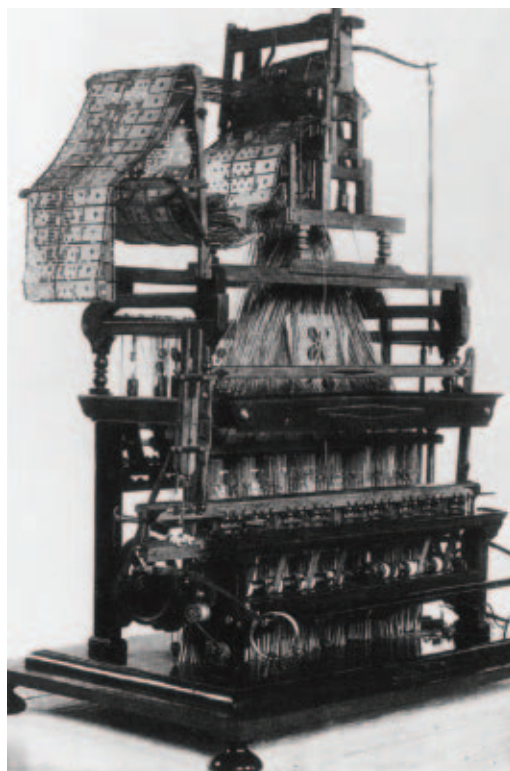
When sailing ships dominated trade — from about the 15th to the mid-19th century — the sails

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were made by thousands of people spinning yarn, and thousands more weaving the yarn into cloth. Without that cloth, we wouldn't have been able to move anything from one continent to another.

Today, even airplanes rely on weaving technology. Modern structural composites are made by weaving fiberglass and other high-tech fibers, then infusing the web with plastic or other materials to create a lightweight, durable structure for boats, planes, and all kinds of modern vehicles.

Many early manufacturing mavericks got their



FAR LEFT: The Jacquard loom, which used punch cards to store weaving patterns, revolutionized the weaving industry. **LEFT:** Paper punch cards for computers were modeled after the Jacquard loom's wooden cards. **ABOVE:** This punch-card reader from the mid-20th century reads data on computer cards, working on the same principle as the Jacquard loom.

start with textile technology. Before Toyota started building cars in the early 20th century, the company built automated looms. The first computer was based on the Jacquard loom, an automated system that used a series of cards with holes punched in them to determine which thread was lifted and which one was not, making it easy to create elaborately patterned cloth with relative ease. This gave rise to the punch-card calculator and eventually those funny cards that were used to run the first computers, which took up an entire room.

Today, we don't weave cloth because we have to; we weave because we want to. Weaving is both a connection to the past and a subversive act, linking us to our ancestors and to revolutionaries. For many, the craft is a rejection of dependence on industrial manufacturing. Learning to make cloth by hand is one way to say, "I can do this myself!"

Liz Gipson is managing editor of *Handwoven*, president of the Spinning and Weaving Association, author of *Weaving Made Easy* (Interweave Press, fall 2008), and the spinning and weaving host of *Knitting Daily TV* on PBS. Needless to say, she is a wee bit smitten with weaving by hand.

The Next Wave of Weaving

What makes weavers giddy these days?

Green yarns Increasingly popular are yarns regenerated from byproducts of natural resources, sold through fair trade, or that are otherwise good for the environment and the people who make them.

Recycled materials Plastic bags, cassette tape innards, rags, and garden waste are all making their way onto weavers' looms.

Shrinking on purpose Making fabric that defies two dimensions is keeping weavers busy, whether it's weaving with yarns that have an extra twist or mixing yarns that shrink with those that don't.

Portable looms From small peg looms that fit in your hand to rigid heddle looms that fold, there are dozens of styles that allow you to weave on the go.

Interiors Weaving for the home — curtains, pillows, rugs, bath towels — can make weavers swoon.

Pattern Fabulous patterning techniques, from over-shot to color-and-weave, create cloth that seems complicated but is actually easy and fun to weave.

Photography by (clockwise from left): Getty Images, Corbis



The Basics of Weaving

BY JANE PATRICK

✦✦ In weaving, two sets of elements — threads, or yarns, and paper strips, or pliable sticks, for instance — are interlaced. One set, the **warp** (vertical), is crossed by another, the **weft** (horizontal). Together, warp and weft form a woven structure.

✦✦ The most basic weave, called **plain weave**, is a simple over-under, over-under pattern. From this elementary basis, infinite variations are possible.

✦✦ Weaving can be done without a loom, as in basket weaving, or with a loom, as in fabric weaving. In either case, the premise is the same: two sets of elements cross each other.

✦✦ A **loom** is simply a device that holds the warp elements in place and taut, so that the weft can be woven over-and-under across them. A loom can be as simple as a picture frame or piece of cardboard, or as sophisticated as a computer-controlled machine. No matter the style or degree of sophistication, a loom's primary function is to hold the warp. The main difference between a simple frame loom and a complex loom is the amount of work it will do for you.

✦✦ With loom weaving, the first step is to put the warp on the loom — a process called **warping**. On a frame loom, the warp is placed directly on the loom. More sophisticated looms require more preparatory steps.

✦✦ Individual warp threads are referred to as **warp ends**, **ends**, or **threads**, and are measured in ends per inch (epi). The weft is the set of threads that cross the warp. Each line of weft is called a **pick** or **shot**. If the weft is yarn, thread, rag strips, or another long, flexible material, it's usually wound onto a **shuttle** for easy handling.

✦✦ You can pass the weft over and under alternate warp threads one at a time, or you can lift alternate warp threads all at once to make a space for passing the shuttle through. This space is called the **shed**. In a frame loom, a **shed stick** (or **pick-up stick**), a flat stick with pointy ends, is inserted in the shed to hold it open for the shuttle to pass through. The edge of the weaving, where the shuttle exits and then re-enters to return to the other side, is called the **selvedge**. The **fell line** is the last row of weft you've woven in the developing cloth — the place where woven and unwoven warp meet.

THE ANATOMY OF A LOOM

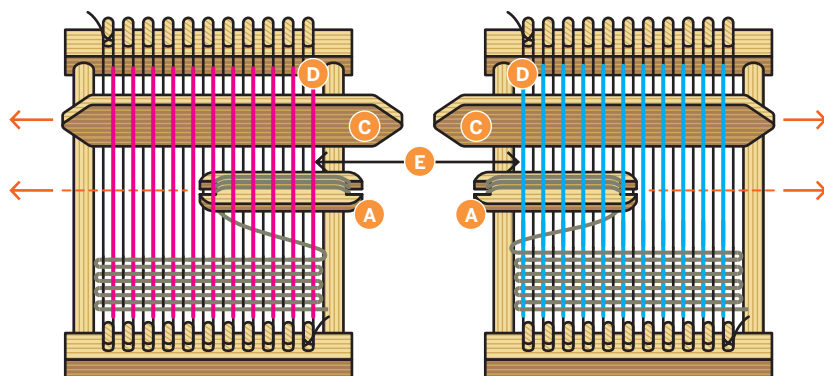
- A Shuttle** Holds the weft thread and carries it back and forth through the warp threads.
- B Heddle** On a rigid heddle loom, raises alternate warp threads all at once.
- C Shed stick** Used with a frame loom, it raises alternate warp threads.
- D Warp** The vertical threads on the loom.
- E Shed** The space between raised and lowered warp threads.
- F Cloth beam or front beam**
- G Warp beam or back beam**

Jane Patrick is the author of *Time to Weave: Simply Elegant Projects to Make in Almost No Time* (Interweave Press), on which this article is based. Read her blog at schactspindle.com.

Illustrations by Nik Schulz

On a simple frame loom, a shed stick is used to lift every other warp thread — first one half of the threads, then the other half. In rigid heddle weaving, warp threads pass alternately through slots and holes in a heddle. Raising it lifts half the threads (the ones in the holes), lowering it raises the other half (in the slots). The shuttle carries the weft back and forth.

WEAVING ON A FRAME LOOM



Half of the threads lifted, moving the shuttle from right to left.

Other half of the threads lifted, moving the shuttle back from left to right.

WEAVING ON A RIGID HEDDLE LOOM

Heddle in down position, moving the shuttle from right to left.

