



# VKR TEX - Tutorials

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## Loom



A Turkish woman in Konya works at a traditional **loom**. Vertical looms were probably the first to be invented.

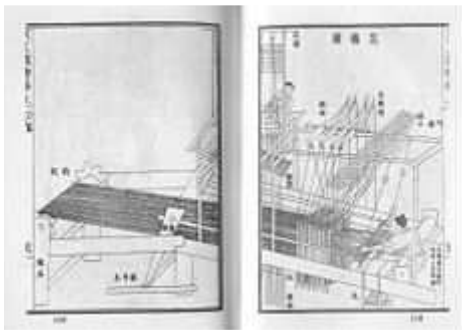


Mechanized loom at Quarry Bank Mill, UK.

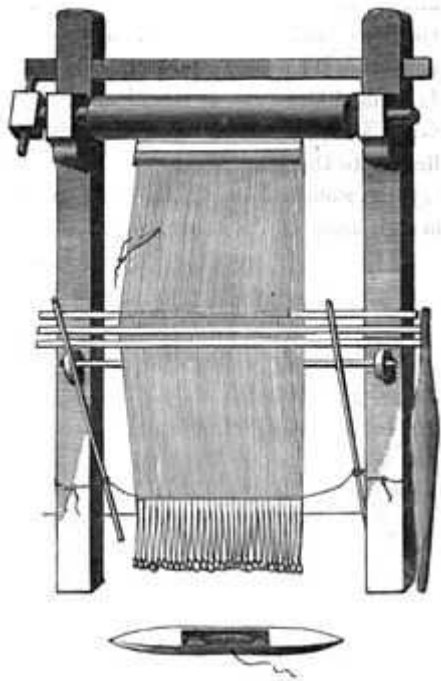
A **loom** is a machine or device for weaving thread or yarn into textiles. Looms can range from very small hand-held frames, to large free-standing hand looms, to huge automatic mechanical devices. A loom can also refer to an electrical cable assembly or harness i.e. wiring loom.

In practice, the basic purpose of any loom is to hold the warp threads under tension to facilitate the interweaving of the weft threads. The precise shape of the loom and its mechanics may vary, but the basic function is the same.

## Weaving



A giant draw loom for figure weaving, from the Chinese *Tiangong Kaiwu* encyclopedia published by Song Yingxing in 1637.



Icelandic warp-weighted loom

Weaving is done by intersecting the longitudinal threads, the **warp**, i.e. "that which is thrown across" (Old English *weorpan*, to throw, cf. German *werfen*) with the transverse threads, the **woof** or **weft**, i.e. "that which is woven" (Old English *wefða*, from *wefan*, to weave, cf. German *weben*).

*Loom* itself derives from Middle English *lome*, in turn from Old English *geloma* (*ge-* was an Old English prefix), meaning "an implement or tool of any kind". The words *lome* and *-loma* are of unknown origin, although they have a cognate in Middle Dutch, *allame*, "tool".

The earliest attestation of *loom* with its specific meaning quoted by the *Oxford English Dictionary* is from the Nottingham Records of 1404, but handwoven cloth existed much earlier, perhaps as far back as 8000 BC.

## Types of looms

### handloom

The earliest looms were vertical **warp-weighted looms**, with the warp threads suspended from a branch or piece of wood and *weighted* or attached to the ground. The weft threads would be pushed into place by hand or a stick that would eventually become the shuttle. At first, it was necessary to raise and lower every warp thread one at a time, which was a time-consuming and laborious process. Basic techniques, such as the insertion of a rod, were developed to produce a *shed*, the space between warp threads (perhaps every other thread would be alternately raised and lowered), so that the weft thread or shuttle could pass through the entire warp at once.

### Ground looms

On a **horizontal ground loom**, the warp would be strung between two rows of pegs. The weaver would have to lean over in order to work, so **pit looms** were developed, with the warp strung over a pit, so the weaver could sit with his or her legs underneath and would then be on a level with the loom.

### Frame looms

**Frame looms** followed basically the same principles as ground looms. The loom was constructed out of sticks and boards attached at right angles (producing a box-like shape), which meant that it was portable and could even be held in the weaver's lap. Frame looms are still in use today, usually as a portable, less expensive, and compact alternative to a table or floor loom. Also known as a Small Loom.



Guatemalan woman weaving on a backstrap loom, 1970s

## Back strap looms

Backstrap looms, as the name implies, are tied around the weaver's waist on one end and around a stationary object such as a tree, post, or door on the other. Tension can be adjusted simply by leaning back. Backstrap looms are very portable, since they can simply be rolled up and carried.

## Foot-treadle floor looms



Four harness table loom.



The yarn passes through the heddles in each shaft of this four-shaft table loom. This is a view from the rear of the loom.

Handweavers today tend to use looms with at least four *shafts* or *harnesses*. Each shaft contains a set of *heddles* through which yarn can be threaded (and attached, through a variety of mechanisms, to the front and back beams of the loom), and by raising the harnesses in different combinations, a variety of patterns can be achieved. Looms with two such shafts are used for weaving *tabby* or *even weave* fabrics. Multishaft looms with eight, twelve, sixteen or more shafts are available.

The shafts on a **floor loom** are controlled by a series of pedals called treadles. This is an important development, since it keeps the weaver's hands free to manipulate the shuttle and it is easy to raise and lower warp threads in selected combinations. As the fabric is woven it is rolled around the cloth beam, as unwoven warp or yarn is unrolled from the warp beam, so the length of the weaving is not limited by the size of the loom. A **table loom** is similar, but, as the name suggests, it is smaller and equipped with hand levers rather than treadles, since it is made to sit on a stand or on top of a table.

A computer assisted loom has no actual treadles as the computer program dictates which harness or shaft is lifted, either by a manual pedal or air cylinders, hydraulic cylinders or electric solenoids. A loom that can only lift the shafts is called a rising shed loom or a Jack loom. A loom that can sink and lift the shafts at the same time is either a Counterbalance (CB) loom or a Countermarch loom (CM), these looms are called a sinking shed loom. Most CB looms are a four harness, a CM loom can use many harnesses up to about thirty two harnesses.

A harness is a complete set of loom parts; a lamm, a shaft and an upper harness of cords or jacks. A shaft is a frame which holds a set of heddles which guide some of the warp but not all on one shaft, there are always more than one shaft on a loom.



A *haute lisse* loom at the Gobelins manufactory in Paris, France

### Rigid heddle looms

**Rigid heddle** looms cross multiple types of looms, including frame looms and backstrap looms. In rigid heddle looms there is typically a single *shaft*, with the *heddles* fixed in place in the shaft. The warp threads pass alternately through a heddle and through a space between the heddles, so that raising the shaft will raise half the threads (those passing through the heddles), and lowering the shaft will lower the same threads -- the threads passing through the spaces between the heddles remain in place.

### *Haute lisse* and *basse lisse* looms

Looms used for weaving traditional tapestry are classified as *haute lisse* looms, where the warp is suspended vertically between two rolls, and the *basse lisse* looms, where the warp extends horizontally between the rolls.

### Power looms



A power loom used in Ettayapuram

The first power loom was built by the Englishman Edmund Cartwright in 1785. Originally, powered looms were shuttle-operated but in the early part of the 20th century the faster and more efficient shuttleless loom came into use.

Today, advances in technology have produced a variety of looms designed to maximize production for specific types of material. The most common of these are air-jet looms and water-jet looms. Computer-driven looms are now also available to individual (non-industrial) weavers.

Industrial looms can weave at speeds of six rows per second and faster.

### **Knitting looms**

Knitting looms (also known as Amish looms or knitting boards) were recently popularized in crafting circles by the Knifty Knitter system. Knitting looms are a descendant of the frame loom. Grooved pegs are spaced along a central frame. These pegs are wrapped with yarn in various ways, then the knitter uses an angled hook to pull the wrapped yarn over the top of the peg, resulting in a fabric with stitches similar to a needle knitted item.