History of Looms: From the Ground Loom to the Power Loom and the Air-Jet Machine

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In one paragraph

No one person invented the loom, and no single date can be put on it. The history of looms begins before writing: woven cloth survives from Çatalhöyük in Anatolia, about 9,000 years ago, and the oldest known picture of a loom is a painted dish from a grave at Badari in Egypt of about 3600 BC, showing a horizontal ground loom. From there the record runs through the warp-weighted loom of Greece and northern Europe, the treadle-operated pattern looms modelled in a Chinese tomb of the second century BC, the European treadle loom and the drawloom, John Kay's fly shuttle (1733), Edmund Cartwright's power loom (patented 4 April 1785), Joseph Marie Jacquard's card-reading machine (patented 1801, in use from 1804 to 1805), James Northrop's automatic shuttle-changing loom (patented 1894), Sakichi Toyoda's Type G automatic loom (1924), and the shuttleless machines of the 1950s onward: the Sulzer projectile loom (1953), the rapier, the air-jet and the water-jet. A mill loom of 1915 ran at 140 to 150 picks a minute; air-jet machines sold today are rated at up to 1,350. This page sets those steps out in a dated, sourced timeline, explains what each one changed, and works the speed-up through one example loom.

At a glance

The history of looms at a glance

When	What changed	Where, and who	Source
About 9,000 years ago	Woven textiles, among the earliest known in the Near East and Europe; the fibre is oak bast	Çatalhöyük, southern Anatolia	Rast-Eicher, Karg and Bender Jørgensen, Antiquity 2021; Çatalhöyük Research Project
About 3600 BC	Oldest known depiction of a loom: a horizontal ground loom with one weaver seated by the heddle rod, painted inside a dish	Badari, Egypt, tomb 3802; Petrie Museum UC 9547	UCL Digital Egypt, textile tools; tomb 3802
About 1950 BC	Two ground looms, each with two weavers, in the wooden workshop model from the tomb of Meketra	Deir el-Bahari, Thebes, Egypt; Egyptian Museum, Cairo, JE 46723	UCL Digital Egypt (description); Breasted's catalogue entry, after Winlock 1920 (museum)
New Kingdom (from the mid second millennium BC)	The vertical two-beam loom appears in Egypt, with more elaborate and coloured cloth	Egypt	Spinazzi-Lucchesi, The Unwound Yarn (2018), ch. 3
550 to 530 BC	Two women weaving at an upright loom, with others weighing and spinning wool, painted on an oil flask by the Amasis Painter: the classic picture of the warp-weighted loom, a type at least 4,000 years old	Athens; Metropolitan Museum of Art 31.11.10	The Met; TRC Leiden

When	What changed	Where, and who	Source
Second half of the 2nd century BC	Four model pattern looms with treadles, for weaving figured jin silk: the earliest known pattern looms	Laoguanshan tomb, Chengdu, China	Zhao and others, Antiquity 2017
Early 13th century	A heddle rod from a horizontal treadle loom, the European loom of the Middle Ages	Coppergate, York, England	York Archaeological Trust find record
1725 and 1728	Bouchon controls a drawloom's figure harness with perforated paper; Falcon replaces it with a chain of punched cards, the first machine of any kind controlled by punched cards; a draw boy still presents the cards	France	Science Museum Group
1733	John Kay's fly shuttle: one weaver can throw the shuttle across a broad loom alone	Bury, Lancashire	Science Museum Group; Grace's Guide
1745	Vaucanson's loom reads the cards from a pierced cylinder and lifts the hooks with a rising and falling griffe, without a draw boy	France	Posselt, The Jacquard Machine (1887); Fondation Napoléon
4 April 1785	Edmund Cartwright's first power-loom patent; his last weaving patent followed on 1 August 1787	England	Cartwright's own letter in Baines, History of the Cotton Manufacture (1835)
1788 to 1789	Twenty power looms at Doncaster, first turned by a bull, then by a steam engine	Doncaster, England	Science Museum Group
23 December 1801	Jacquard's patent for a machine to replace the draw boy; the machine in its working form dates from 1804 to 1805	Lyon, France	Fondation Napoléon; Science Museum Group
1803 to 1813	Horrocks's power loom, built entirely of iron; with the warp-dressing frame of Johnson and Radcliffe it made power weaving pay	Stockport, England	Baines (1835)
1822	Richard Roberts patents a precision-made cast-iron loom, built at 4,000 a year by 1825	Manchester, England	Grace's Guide
1833	About 100,000 power looms in Great Britain (2,400 in 1813; 14,150 in 1820; 55,500 in 1829), against some 250,000 hand-loom cotton weavers	Great Britain	Baines (1835)
1842	The Lancashire loom of Kenworthy and Bullough: a weft fork and a loose reed stop the loom when the weft breaks or the shuttle traps, and a self-acting temple holds the cloth to width	Blackburn, England	Grace's Guide; Science Museum Group
27 November 1894	James H. Northrop's US patent 529,940, assigned to George Draper and Sons: a rotating magazine puts a full bobbin into the running shuttle without stopping the loom	Hopedale, Massachusetts	US patent record; US National Park Service
1924	Sakichi Toyoda's Type G automatic loom with non-stop shuttle change; its patent was sold to Platt Brothers in Britain in 1929	Japan	Toyota Industries
About 1950	An air-jet loom built by A. B. Maxbo, now in the Science Museum Group collection; jet looms were developed in Czechoslovakia through the 1950s	Norrköping, Sweden; Czechoslovakia	Science Museum Group; National Technical Museum, Prague

When	What changed	Where, and who	Source
1953	Sulzer introduces the projectile weaving machine	Sulzer	Sulzer
1968 and 1988	Dornier puts its rapier machine into series production, then its air-jet machine	Lindau, Germany	Lindauer Dornier
1983	Bonas shows the electronic Jacquard at ITMA Milan; a single machine now has up to 31,104 hooks	Belgium	Bonas
2023	Air-jet machines rated at up to 1,350 wefts a minute, against about 140 for a shuttle loom of 1936	Ieper, Belgium; Japan	Picanol; Tsudakoma

Key figures and their sources

- Woven cloth: the textiles from Neolithic Çatalhöyük, a settlement in southern Anatolia that dates back 9,000 years, are among the earliest known examples of weaving in the Near East and Europe, and a 2021 study found them to be made of locally gathered oak bast, not flax.
  Source: dates back 9,000 years (catalhoyuk.com)

Formulas

> `The site’s loom production calculator does that sum: picks per hour = speed × 60 × efficiency, metres per hour = picks per hour ÷ picks per inch × 0.0254.`

Revision questions

The questions readers ask most, with the article's own answer.

When was the loom invented?

There is no invention date, only earliest evidence. Woven cloth survives from Çatalhöyük, about 9,000 years ago, and the Badarian cloths of Egypt keep selvedges that prove a loom.

Who invented the loom?

Nobody whose name is known; the loom is prehistoric and was arrived at independently in several regions. The named inventors belong to its later improvements: Falcon (punched cards, 1728), Kay (fly shuttle, 1733), Vaucanson (self-acting card loom, 1745), Cartwright (power loom, 1785), Jacquard (1801 to 1805), Northrop (automatic shuttle change, 1894) and Toyoda (Type G automatic loom, 1924).

Who invented the power loom, and when?

Edmund Cartwright took the first power-loom patent on 4 April 1785 and his last weaving patent on 1 August 1787, and ran twenty looms at Doncaster, from 1788 to 1789 by steam. His loom did not pay.

How did the power loom impact society?

It multiplied the cloth one weaver could make by nine or ten within a generation, as Baines’s figures show (two pieces a week by hand in the 1830s against eighteen to twenty by a power-loom weaver of 15 to 20 with four looms and a child helper), and it did so with young people rather than skilled men.

What is the difference between a power loom and an automatic loom?

Both are driven by power. A plain power loom stops when the weft in the shuttle runs out, and the weaver changes the pirn by hand.

What were the first, primitive looms like?

Three types, all still in use somewhere: the ground loom, two beams pegged flat to the earth, as on the Badari dish; the warp-weighted loom, an upright frame with the warp hanging from a top beam and weighted with clay or stone, as on the Greek vase in the Met; and the backstrap loom, with the far end tied to a post and the near end to a strap round the weaver’s waist.

Test yourself

Ten questions on this topic. Answer them without looking, then check on the last page.

1. On the warp-weighted loom, in which direction does the cloth grow as it is woven?
2. Where and when do the earliest known models of treadle-operated pattern looms come from?
3. On a drawloom, what did the draw boy do?
4. What did Jean-Baptiste Falcon introduce in 1728 to control the drawloom?
5. What did John Kay’s fly shuttle of 1733 allow a weaver to do?
6. Why did the early power loom fail to save labour until the Johnson and Radcliffe dressing frame?
7. On the Lancashire loom of 1842, which devices stopped the loom when the weft broke or the shuttle trapped?
8. In Sulzer’s projectile weaving machine of 1953, how is the weft carried across the shed?
9. Why is the water-jet loom the machine for synthetics?
10. How does the rated speed of a modern air-jet machine compare with a shuttle loom of 1936?

Answers

Each answer is stated in the article; the section to read again is named after it.

1. **From the top down, because the weavers push each weft upward.**
   See: The first looms: ground, warp-weighted and backstrap
2. **A Han dynasty tomb at Laoguanshan, Chengdu, China, second half of the second century BC.**
   See: Treadles, shafts and the drawloom
3. **He pulled the cords of the figure harness for each pick in the order the design required.**
   See: Treadles, shafts and the drawloom
4. **Punched cards tied in an endless chain, the first machine of any kind controlled by punched cards.**
   See: Treadles, shafts and the drawloom
5. **Send a lighter shuttle the full width of a broad loom on his own.**
   See: Kay's fly shuttle, 1733
6. **Every loom had to be stopped repeatedly to dress the warp with size as it came off the beam.**
   See: The power loom and the Industrial Revolution
7. **A weft fork and a loose reed; a self-acting temple held the cloth to width.**
   See: The history of looms at a glance
8. **By a small gripper projectile, which is conveyed back beneath the shed.**
   See: Shuttleless looms: projectile, rapier, air-jet and water-jet
9. **It can weave only filament yarns.**
   See: Shuttleless looms: projectile, rapier, air-jet and water-jet
10. **Up to 1,350 wefts a minute, against about 140 for the 1936 shuttle loom.**
    See: The history of looms at a glance

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