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COUTURE_MODULE 3_WEAVING

MAIN CHARACTERISTICS



WEAVING TOOLS

- At first, people wove narrow bands with their fingers, tying one end to their belt. That kind of weaving remained common for a long time in Central Asia, where people were nomadic and couldn't carry big heavy looms with them.
- Throughout time, some basic tools used in creating complex textiles have remained constant, such as the ones used for spinning thread: wooden spindles (smooth wooden sticks) and ceramic spindle whorls (disks threaded on the spindle).

<https://artextiles.org/en/node/189>



WEAVING TOOLS

- Early humans made ropes and wove nets to survive. Thus, the earliest weaving tool, the spindle, emerged and weaving was created.
- Gradually, skills included cultivating and processing fiber plants, spinning, weaving, and dyeing.
- The main tools used in the ancient period were:
 - ✓ Spindles
 - ✓ Needles made of different materials, such as bone, ivory, and metal
 - ✓ Horizontal and vertical looms
 - ✓ Shuttles
 - ✓ Spinning combs
 - ✓ Vessels
 - ✓ Bobbins



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WEAVING TOOLS



Ancient Greek loom weight



Ancient Greek loom weight



Ancient Greek disc-shaped loom weight



Ancient Greek bobbin



Ancient Greek conical spinning whorl

<https://trc-leiden.nl/trc-digital-exhibition/index.php/ancient-greek-loom-weights/item/140-digital-catalogue>

The Textile Research Centre in Leiden houses eleven ancient Greek loom weights, and a small number of ancient Greek bobbins and spinning whorls.



WEAVING TOOLS

- The main textile tools used in antiquity continued to be used through time, with varieties in the basic technological conceptions: the thread was spun with the *spindle* and the fabric was woven on the *loom*.
- Textile production in antiquity was a complex and very time-consuming craft that required specific know-how and a variety of tools.
- Ancient textile tools, made of clay, stone or bone, are possibly the most important archaeological source regarding ancient textile production.
- They are found in archaeological excavations and studied by specialists using specific analytical methods.
- This information is complementary to that of other sources, such as written sources, iconography, ethnological data, and the finds of ancient textiles, which are quite rare, due to their organic nature.

<https://artextiles.org/en/node/189>



WEAVING TOOLS

- Tools could be distinguished according to the stage of the textile production.
- **1. Processing of raw material:**
 - Tools, such as the *scissors* to shear sheep (*kouris*), *sticks* to beat the material and separate the fibres, and *combs* for combing wool and linen could be listed in this category.

• <https://artextiles.org/en/node/189>



WEAVING TOOLS

•2. *Thread production:*

- Spinning is the operation during which the fibres are twisted in order to produce a continuous and solid thread that can be used on the loom.
- At earlier times, spinning would have probably been carried out by hand, without instruments. However, the use of tools allows the production of more thread in less time.
- The most common tools of thread production in ancient Greece were:
 - ✓ the spindle (*atraktos*),
 - ✓ the distaff (*hēlakatē*) and
 - ✓ the spindle-whorl (*sphondylos*).

•<https://artextiles.org/en/node/189>



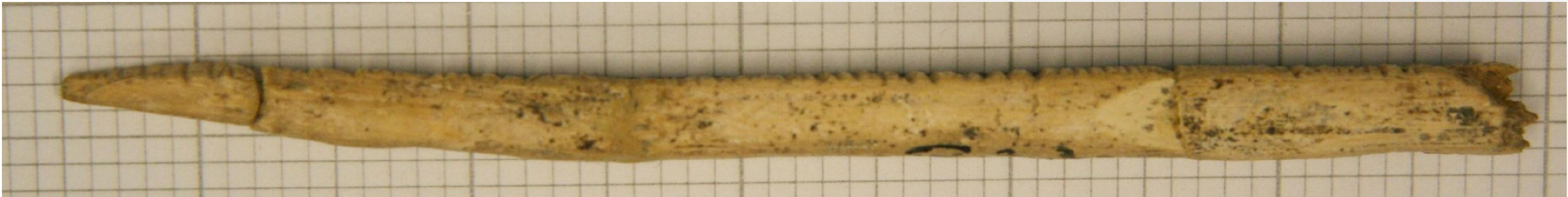
WEAVING TOOLS - THE SPINDLE

- The *spindle* is a simple, wooden rod at the bottom of which was inserted the spindle-whorl, a perforated circular weight of clay, stone, bone or wood.
- In Greece, spinning was carried out approximately in the same way, from prehistory to modern times. It consists in taking some fibres from the distaff, stretching them with the fingers and simultaneously twisting the spindle. With the double movement of the spindle and the fingers, the fibres are being stretched and twisted, thus forming a solid thread, which is wrapped around the spindle.

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Spindle whorls & bone batten

<http://threads-of-time.carlos.emory.edu/spinning>



WEAVING TOOLS - THE SPINDLE

- There are variations of this instrument in every period and culture. We find the spindle-whorl sometimes at the bottom, sometimes at the top, and other times at the middle of the spindle. In addition, the spindle-whorl was made of various materials, such as clay, stone, bone or wood and had different shapes: conical, biconical, cylindrical, spherical or, often in the shape of a fine, circular disk.
- Moreover, ethnological studies have shown that spinning was performed using different gestures in each society: the spindle, for example, instead of floating in the air, can also rest on the ground, inside a bowl or on the spinner's thigh and rotate in a supported position.

•<https://artextiles.org/en/node/189>



WEAVING TOOLS - THE SPINDLE & BONE BATTEN

- Spindle whorls are small round or disk-like ceramic pieces, used for spinning loose fiber into thread. The spinner gradually fed loose cotton fiber onto the spindle and spun it like a top.
- Whorls could be decorated with various motifs, natural elements (the sun, flowers, etc.), or geometrical shapes.
- The bone batten (carved or simple) is another elaborate weaving tool. Its pointed ends used for picking up certain warps to create patterns and its wide blade for packing down wefts.



WEAVING TOOLS

- From prehistoric times, spindle-whorls from Troy and the Acropolis of Athens were famous for their quantity and decoration. The weight and diameter of spindle-whorls depended on the desired thickness of the threads.
- Spindles are rare finds in Greece because they were made of wood which is rarely preserved.
- However, two bone spindles from the 4th century B.C. have been discovered in Kerameikos.
- The spindle and spindle-whorl could be of precious materials, such as ivory and silver, like the famous “silver *hēlakatē*” of the Homeric Helen.

•<https://artextiles.org/en/node/189>



WEAVING TOOLS

- The *distaff* is the wooden, forked rod that accommodates the raw material for spinning. It changes size depending on the raw material. In general, the distaff for wool is shorter than the one for flax and plant fibers.
- Raw materials, threads and tools were transported and stored in baskets (*kalathos, talaros*). As they were made of organic materials, they are rarely found in excavations. However, models of the 9th century B.C. ceramic baskets are exhibited in the Museum of the Agora.
- Another textile instrument depicted in ancient iconography is the *epinētron*, a clay knee protection of semi-cylindrical shape and coarse surface. It is positioned on the spinner's thigh and used for twisting fibers on its surface in order to make a first, coarse thread that would be later spun with the spindle.

<https://artextiles.org/en/node/189>



WEAVING TOOLS

•3. *Textile Production:*

- The loom is a technological invention that facilitates the interweave of the warp and the weft in order to produce a cloth. The conception is that one thread system, the warp threads, have to be well taut, in order that the other system, the weft threads can be inserted quickly between the warps.
- In the eastern Mediterranean, there is archaeological evidence for two types of loom, depending on the period and the culture: the horizontal and the vertical loom.

<https://artextiles.org/en/node/189>



WEAVING TOOLS

•4. *Finishing:*

- This is the last stage of preparation of the cloth before its use.
- In this stage, the fullers (*knapheis*) had the first role and carried out a series of activities in specific workshops and using a variety of tools. After fabrics were washed and fulled with the feet to soften and felt the fibers, they were left to dry. Fullers were also responsible for pleating fabrics using a special press (*ipos*) and create the permanent pleats depicted in ancient iconography.
- Finally, the decorative techniques used after weaving, such as embroidery, also required a set of tools, like varieties of needles of different sizes (*belonis*, *rhaphis*), also necessary for sewing.

<https://artextiles.org/en/node/189>



THE LOOM

- ❖ In order to weave you need a tool called LOOM.
- ❖ In history, looms have evolved from simple to more complex and performing forms, later on have evolved in the mechanical ones.
- ❖ Through its built, the loom assures: the equal tension of the warp threads; their separation in a controlled order up-down/down-up or front-back/back-front, that is creating the shed in order to help the precise intertwine of the warp threads with the weft ones.
- ❖ The vertical or horizontal alignment of warp threads was the key element which led to the emergence and development of different loom types, the vertical and the horizontal loom
- ❖ The studies and the reenactments in this field proved that starting with the Upper Paleolithic new weaving techniques specific to a different geographical area were invented and used. This fact was due to the environmental traits, to the area of spreading of different types of raw materials.
- ❖ Researcher were able to identify looms, referred to in the specialized literature as devices/ weaving systems/ primitive looms, from the prehistoric era.



THE LOOM

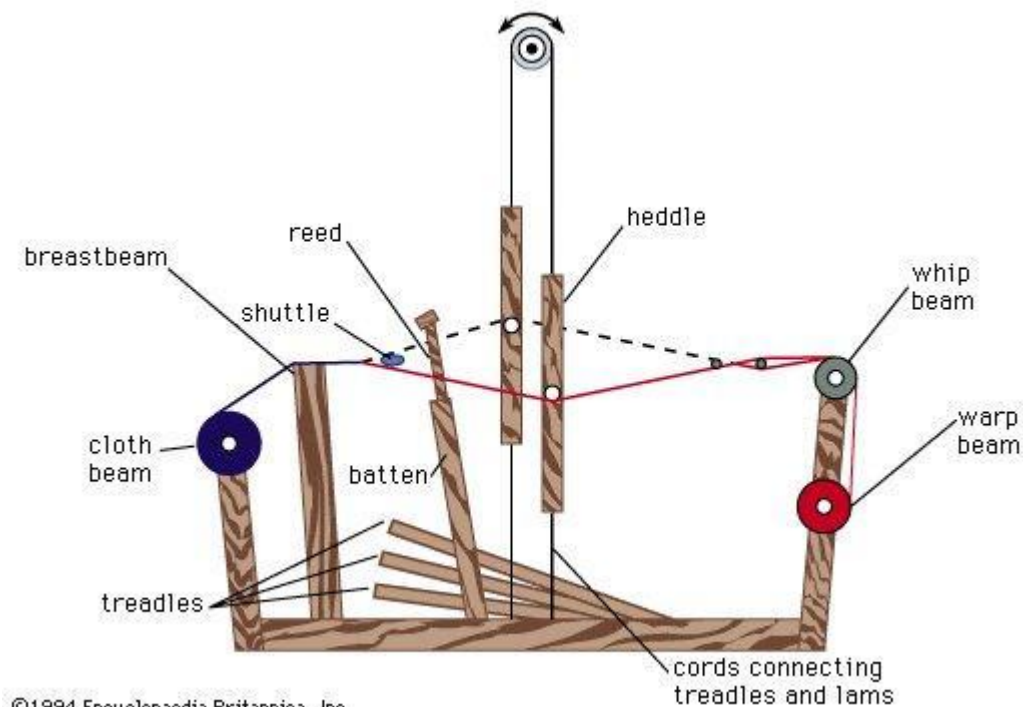
- ❖ The research of the weaving tools' evolution was based on tying the archeological evidence with the ethnographic information concerning the built of contemporary looms.
- ❖ The archeological, anthropological or ethnographic researches, until today, were not able to place exactly in time and space the emergence of the weaving techniques.
- ❖ The researchers assume that this technique developed and was updated starting with the evolution of the Upper Paleolithic civilization.
- ❖ The Iron and Bronze Age bring a significant technological evolution and development of this craft mainly due to the discovery and usage of new materials: bronze and iron. In time archeological discoveries of textile fragments are more and more common, thus proving the existence and usage of a large variety of textile making techniques.
- ❖ Gradually more documents and graphic representations appear, for example around 1000 A.D. the existence of new loom models is proven. This looms no longer have the warp tied to weights but rather it is tied to upper and bottom bars and the cloth is formed at the bottom. This type of loom is used today as well.



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THE PARTS OF THE LOOM



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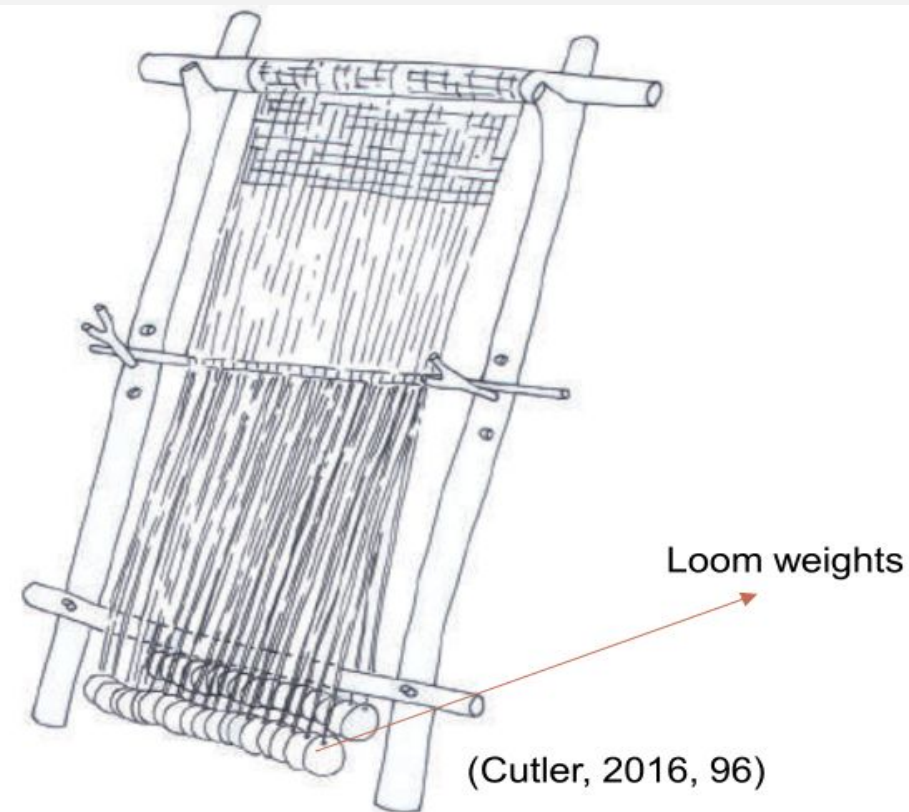
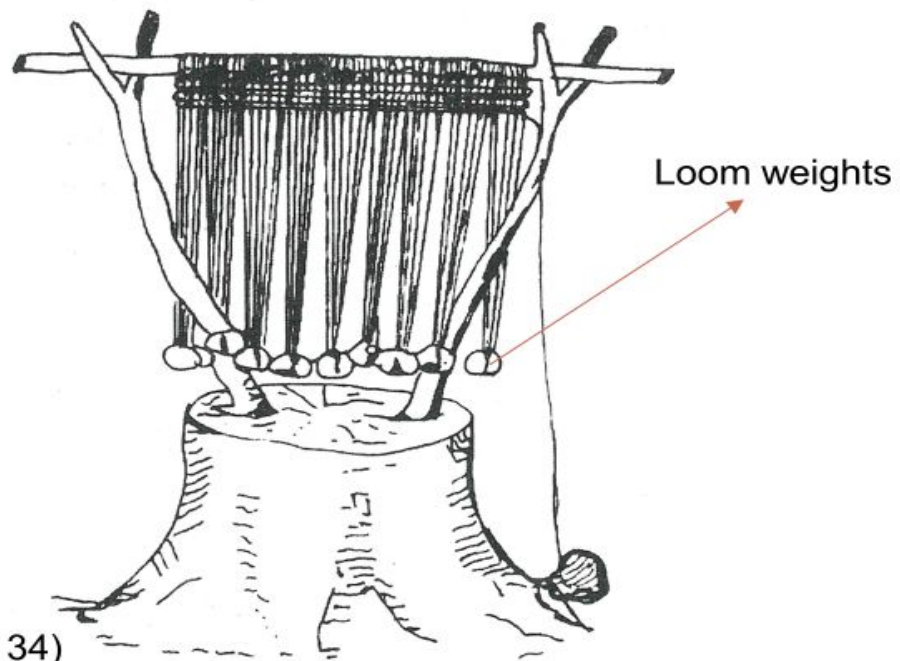
<https://www.britannica.com/technology/loom>



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THE LOOM



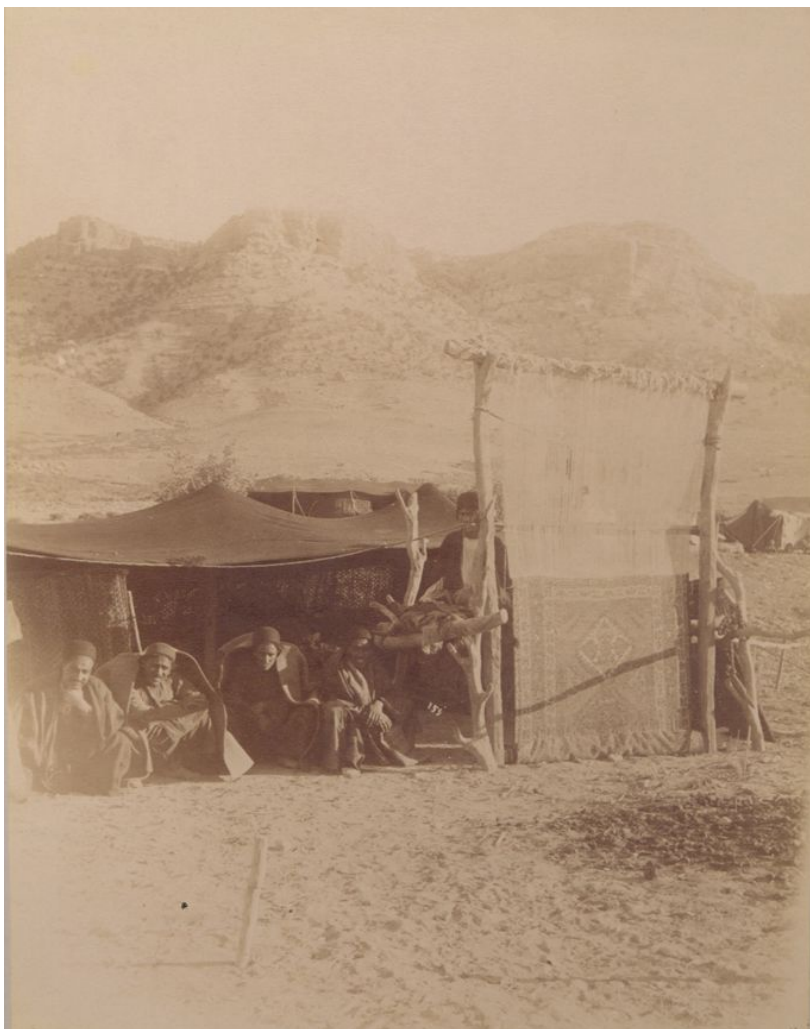
Representations of a warp - weighted looms with a fixed position



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THE LOOM

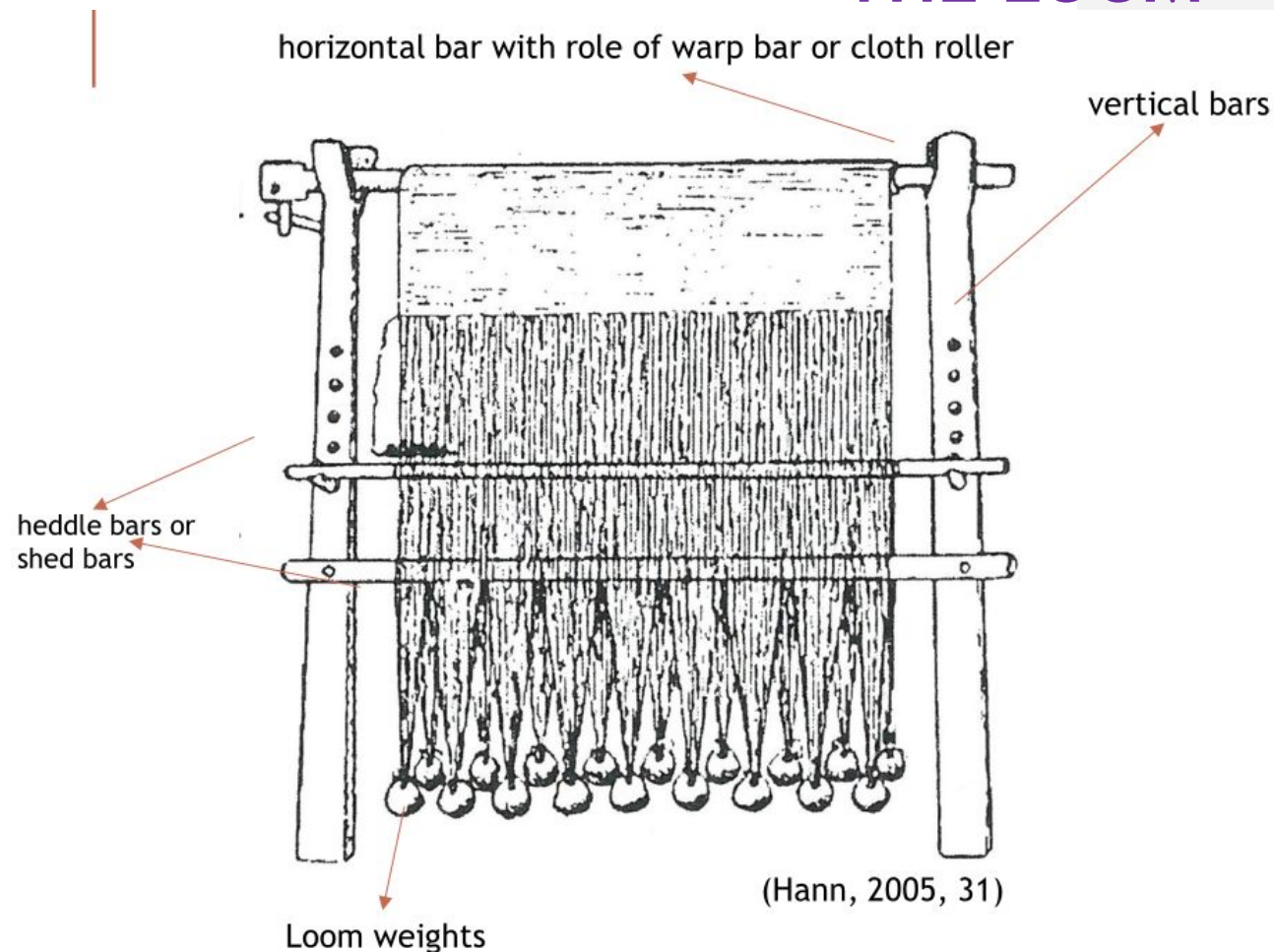


Representation of a warp - weighted looms
with a fixed position.

Antoin Sevruguin photo. Group of nomads people from
Tehran, Islamic Republic of Iran (Persia in the past).
Late nineteenth century (1880-1900).
The documentary graphics collection of the ASTRA
Museum, Sibiu, Romania.



THE LOOM



Warp weighted loom

- In time the vertical bars were united in the upper part with a horizontal bar that also had the role of warp bar or cloth roller
- The weavers begin to use also horizontal bars (as heddle bars or shed bars) for creating the shed
- It is a widely used loom, fact proven by the numerous weights found in archeological sites across Europe.

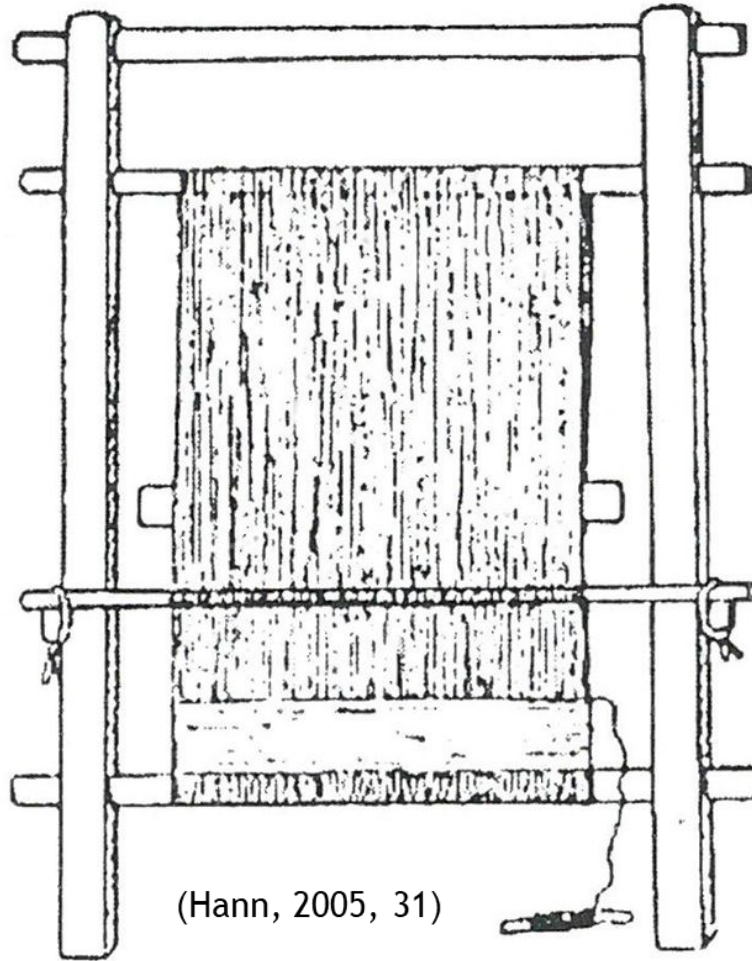


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THE LOOM

The vertical loom with two crossbars



(Hann, 2005, 31)

*The best fibers are obtained from stems of plants such as: flax, hemp, jute. The separation of bast fibers from stems is obtained through a chemical and biological process called retting. As a consequence of the processing of bast fibers that consists of the crushing of the stems, cleaning and combing after which fibers of different qualities are obtained. For example: the spun - higher quality and the tow v- fibers of inferior quality.

- It is considered to be the first simple vertical loom
- Consists of: two wooden pillars tied to the ground on one end and are united by crossbars
- The warp threads are spread across the upper and the lower bars, thus ensuring the tension of the warp threads, essential for weaving
- The weft is made by hand and it is beaten with a stick
- The weaving formed in the upper part of the loom
- The height of the loom was according to the height of the weaver
- This type of loom was used by Egyptians and Romans
- The loom spread across the world once the raw materials used were diversified
- The emergence of bast fibred draw the perfecting of the looms - the most important being the insertion of heddles in order to create the shed



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THE LOOM



A Navajo Woman Weaving.

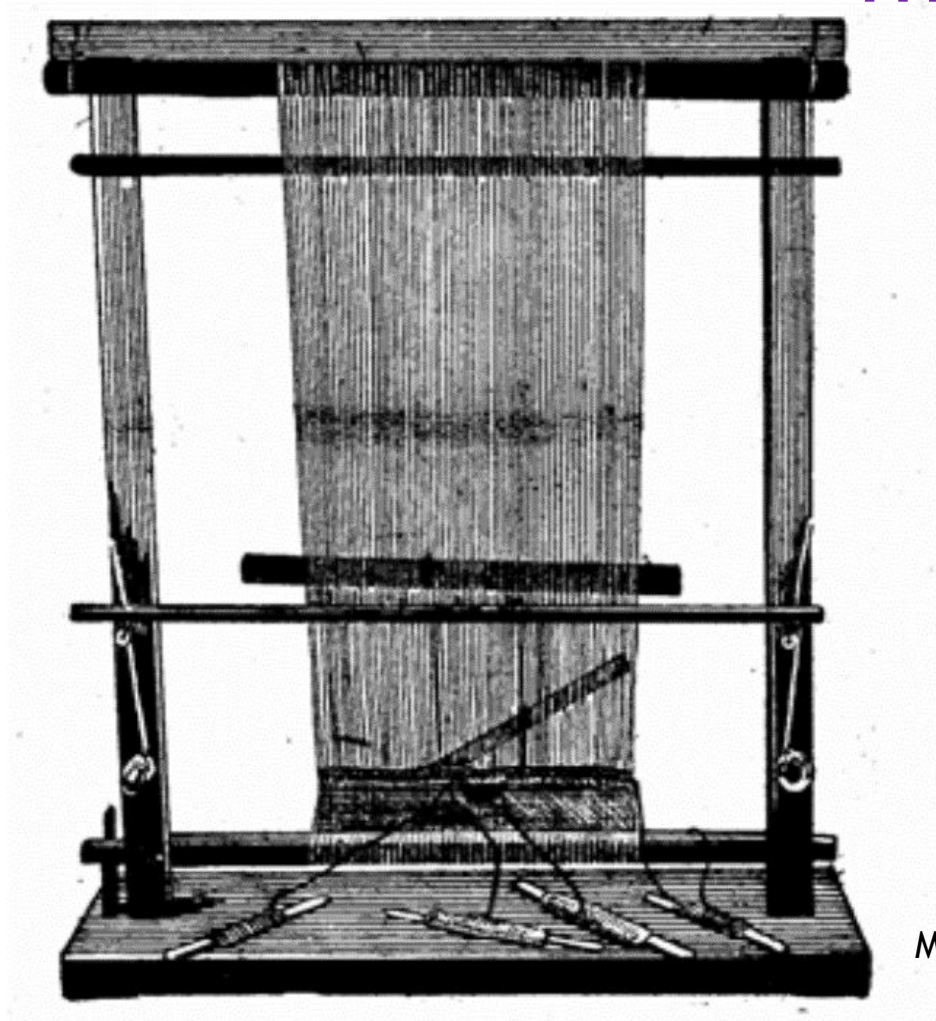
Postcard format chromotypie. The series of North American Indians. Beginning of the twentieth century (1900-1907). The documentary graphics collection of the ASTRA Museum, Sibiu, Romania.



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THE LOOM



- This transformation allowed the growth of the number of warp threads and the beating of the weft became more precise (Zaharia, p. 60)
- These type of loom is similar to the loom used today in tapestry in Europe and beyond

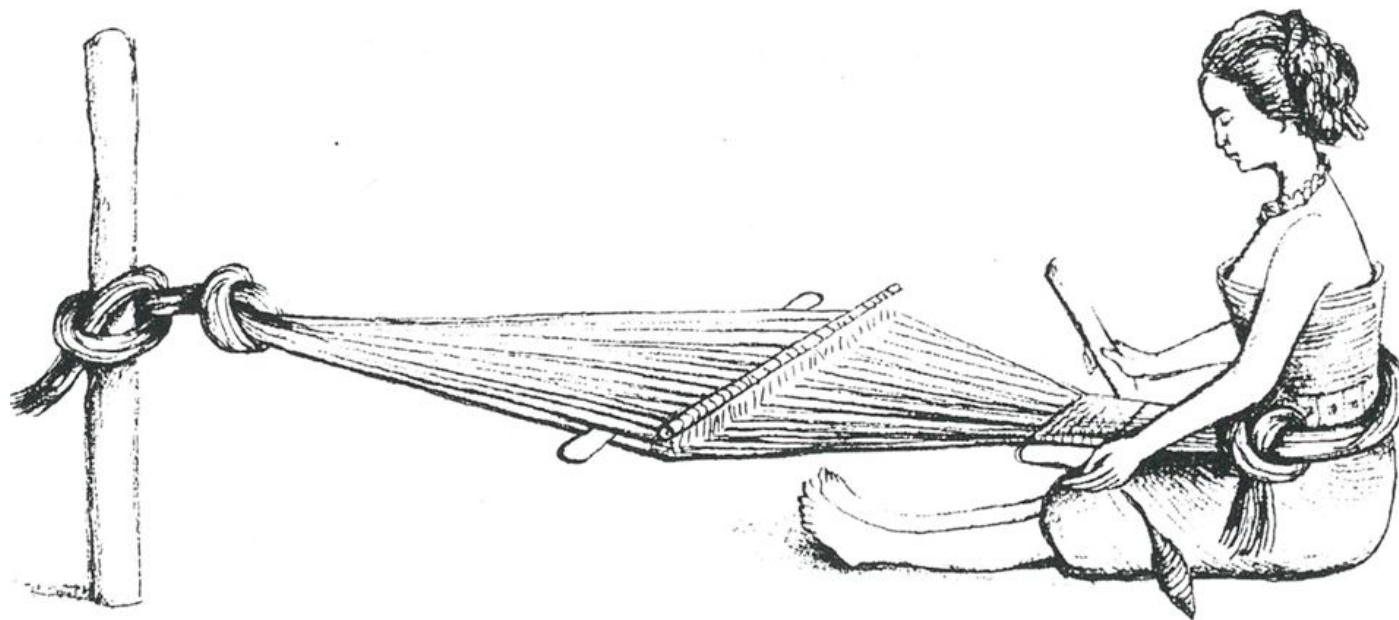
Model of tapestry loom (Cioară, 2008, 25)



THE LOOM

Device for weaving narrow straps

- The warp threads are placed in a slightly oblique position
- The threads are tensioned by the weaver by bending forward or backwards



Woman working at a band loom (Marian, 2009, 32)



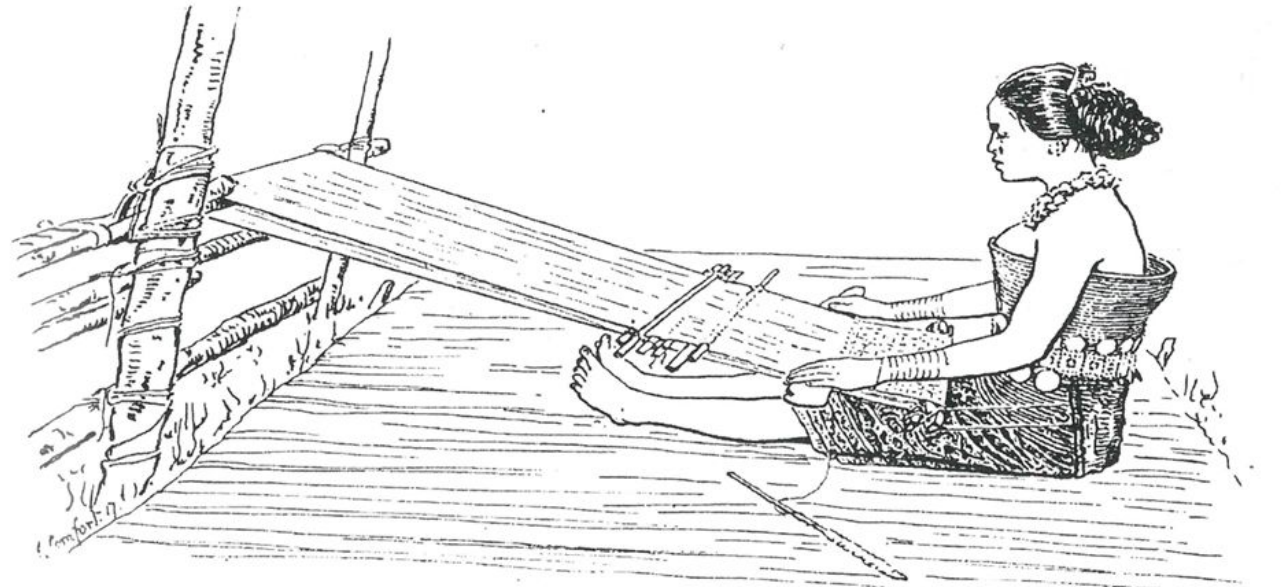
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THE LOOM

Blackstrap Loom attached to the waist of the weaver

- A larger number of warp threads is used; the threads are distributed on a longer length
- The ends of the warp threads are tied, individually or in groups, on a bar equal in length with the desired result
- A bar is tied to the fixed bar and another one is tied to the weaver's waist



A weaving device attached with the help of a belt to the waist of the weaver. (Marian, 2009, 32; Roth, 1918, 67)



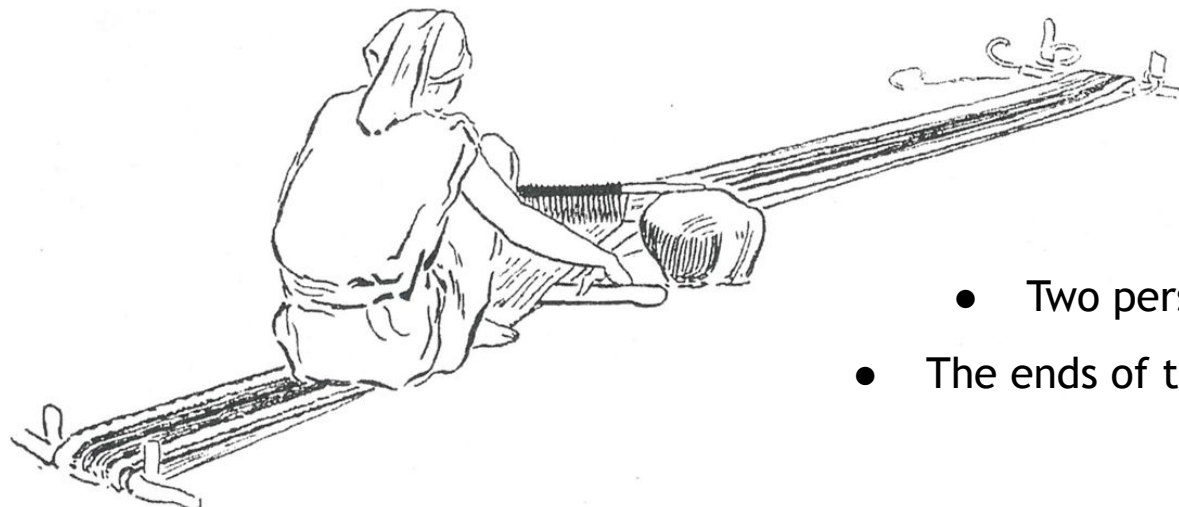
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THE LOOM

The first horizontal weaving device.

- The weaving threads are placed horizontally
- It allows the possibility to weave a cloth longer and wider
- Two persons could weave in the same time on opposite ends of the cloth
- The ends of the warp threads are tied, individually or in groups, on a stiff bar equal in length to the length of the desired object
- The ends of the bars are tied to two vertical frames (very small), placed on the ground, which according to some researchers represents the first horizontal weaving device.



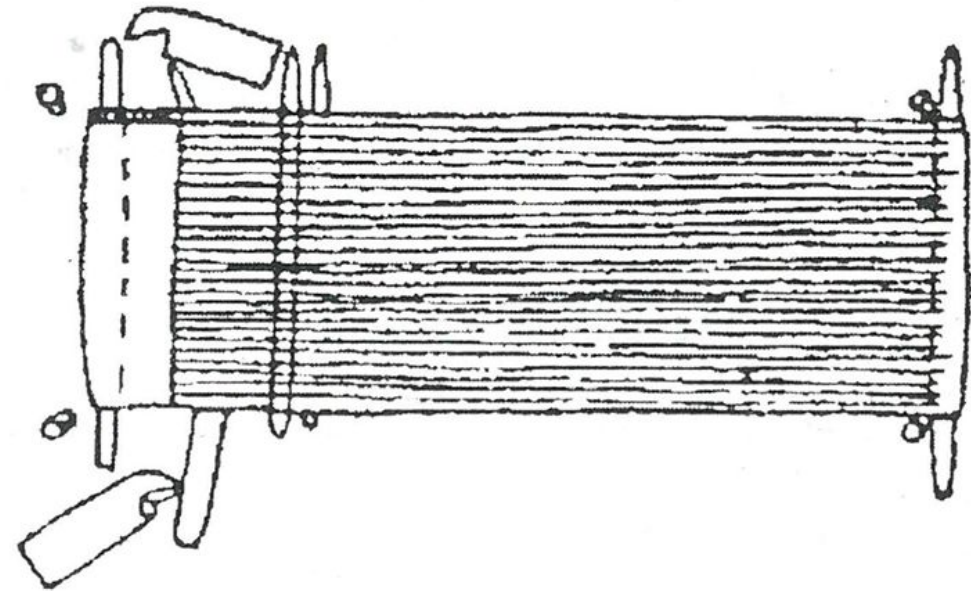
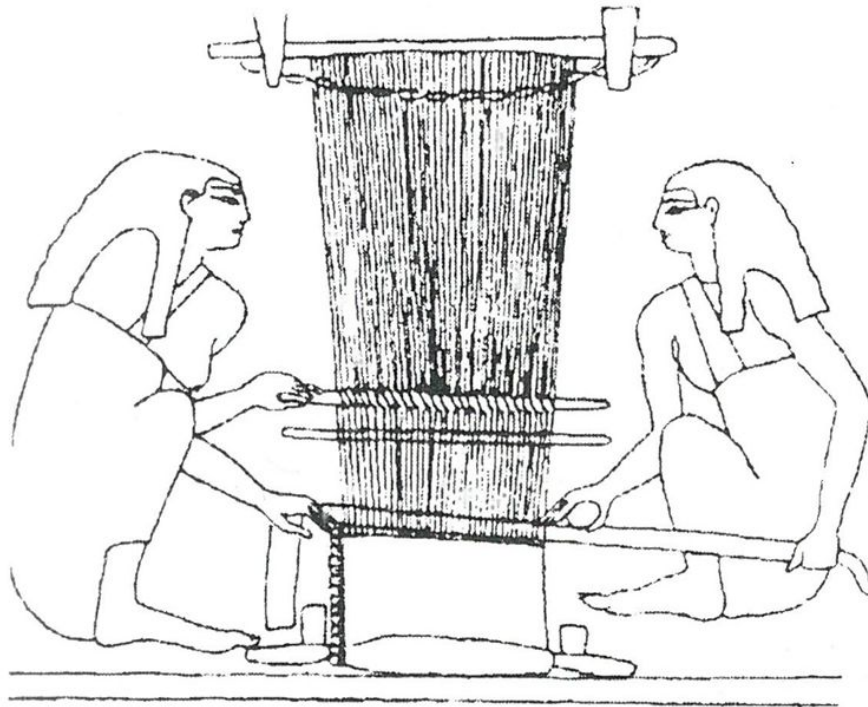
Woman working at a horizontal ground loom
(Roth, 1918, 46)



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THE LOOM



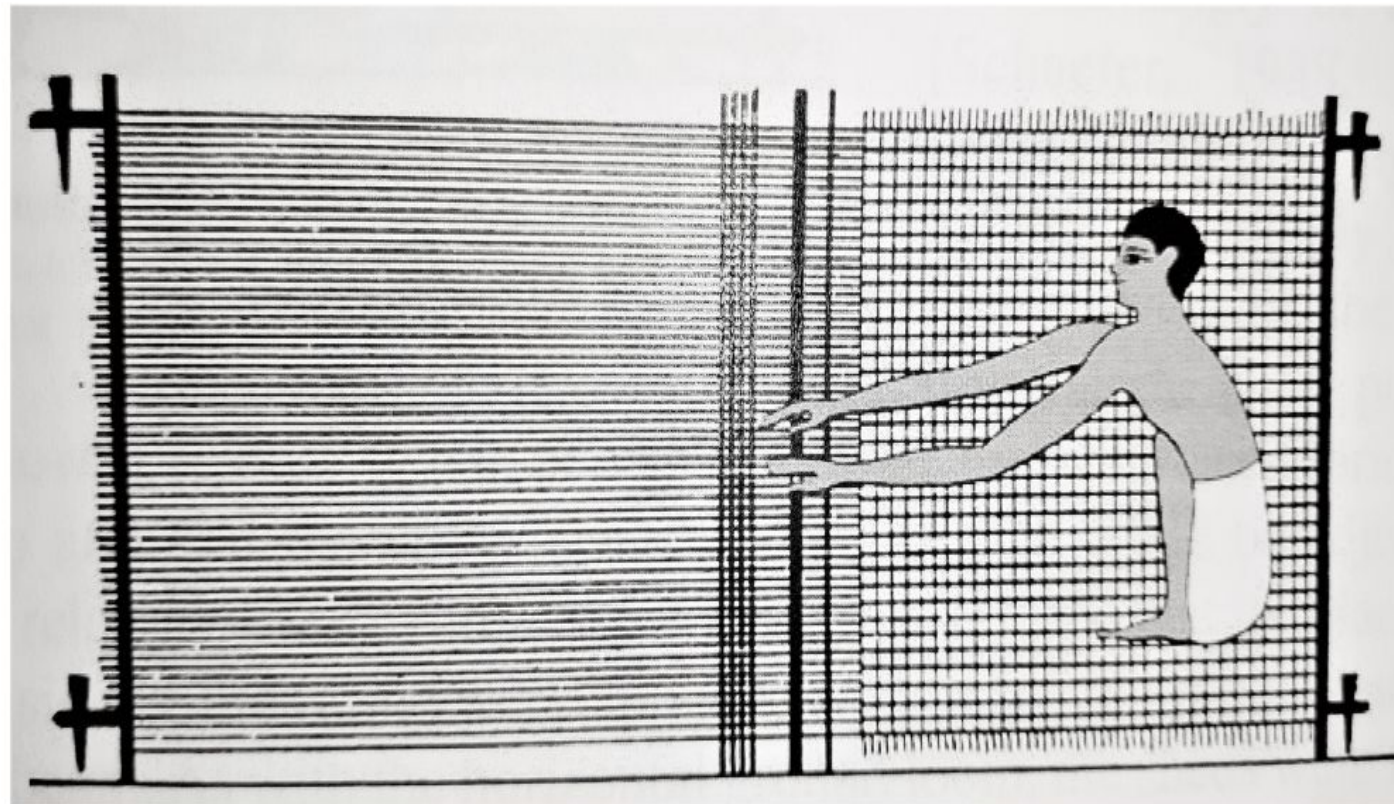
The representation of a horizontal loom, derived from mural in tomb at Beni Hasan, Egypt (1900 BC). The vertical representation of the loom is due to the characteristics of Egyptian Arts of presenting a perspective of objects which imposed the representation of all the components. (Hann, 2005, 28)



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THE LOOM



Interpretation of a horizontal loom with one weaver,
derived from another mural in tomb at Beni Hasan, Egypt (1900 BC).

(Hann, 2005, 29)



THE LOOM

- The horizontal loom most likely develops in parallel with the vertical loom
- The horizontal positioning gave it multiple developments possibilities: first it was raised from the ground either by means of a tripod-type frame that supported the warp stretching system or on a rectangular frame; new beams appear; the warp stretches from the back to the front where the woven cloth will be wrapped around the front beam; the threads are suspended by pulleys and for during the Middle Ages, the loom gradually evolved towards the treadle loom
- The most intricate looms appear in the East, China, India, Persia and Asia Minor and was brought to Europe in the 10th -13th century where in can be found in the German area, in Northern France, at the border between Switzerland and Germany, in Albania or Romania*.
- In Europe the documents attest the usage of the horizontal treadle loom starting with the 10th century. The oldest image of the horizontal weaving warp with threads and pedals dates back to around 1200 AD. and is kept in Cambridge, Great Britain.

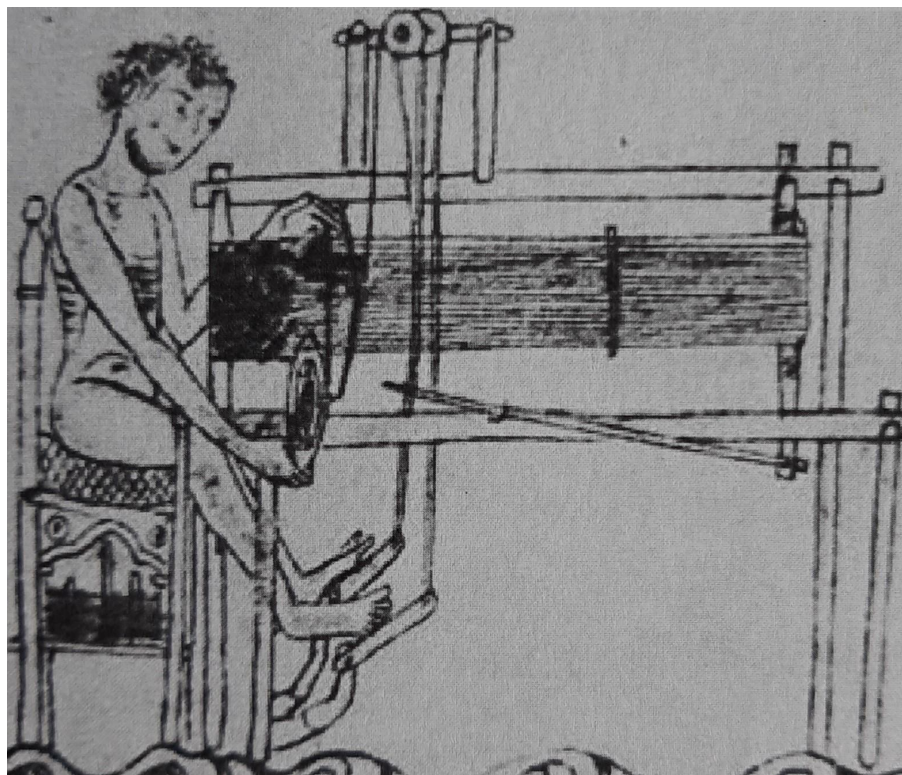
*On the Romanian territory, the archeological discoveries from Dinogetia (Gărvan, Tulcea county) show that the horizontal war with threads was used in the 11th century.



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THE LOOM



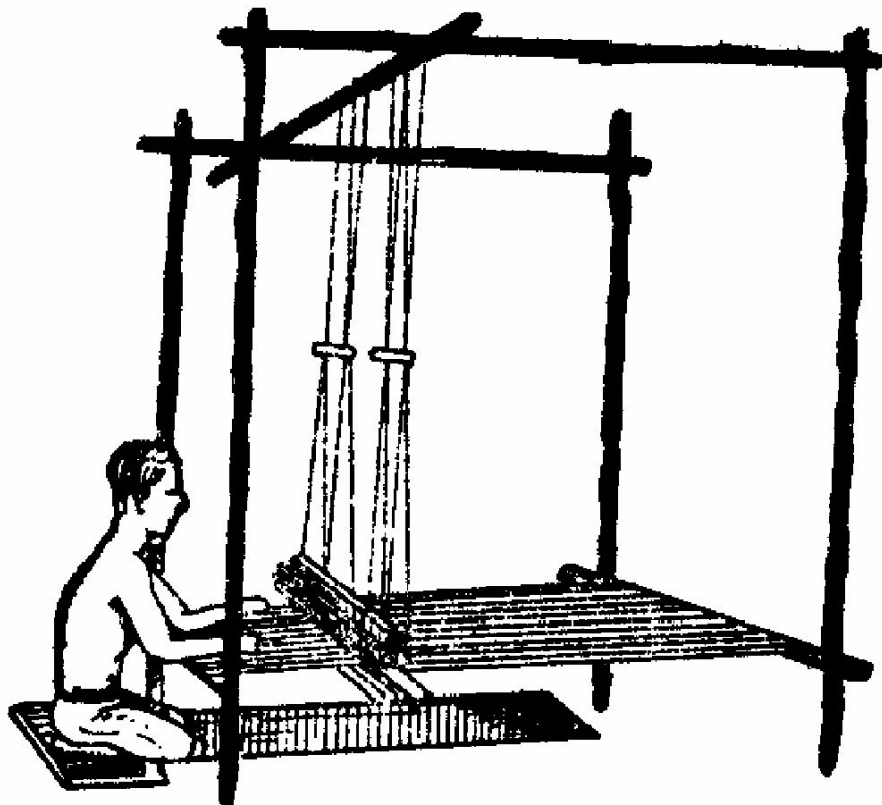
Weaver working at treadle loom. 13th century, Britain. (Hann, 2005, 37)



Weaver working at treadle loom with harnesses suspended from above. Late 14th century, Germany. (Hann, 2005, 37)



THE LOOM



The buried manual horizontal loom.
(Cioară, 2008, 27)

- The horizontal loom with heddles activated with the feet by the weaver it was initially placed in a hut, buried half way through in soil in which case the humidity made the threads more flexible.*

* On the Romanian territory these type of loom it was called „argea”



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THE LOOM

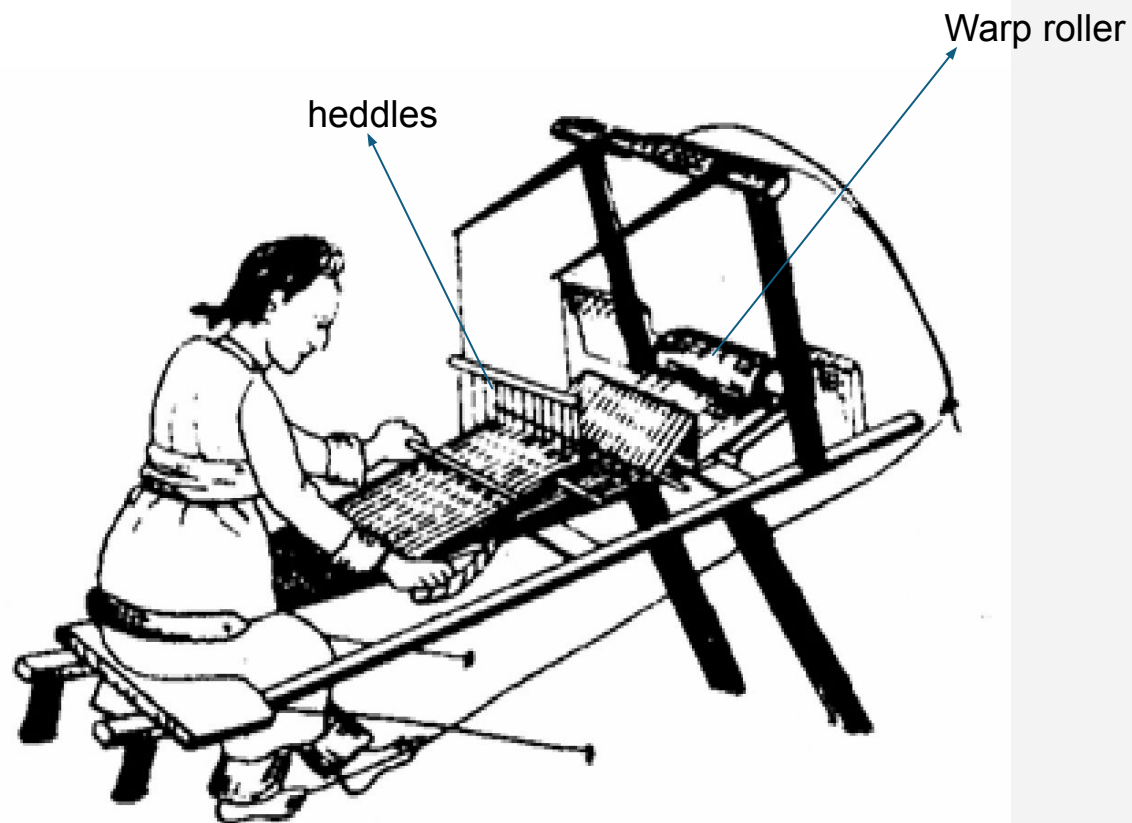


Japanese weaver.
Second quarter of the twentieth century

Source: [https://commons.wikimedia.org/wiki/
File:Japaneseweaver.jpg](https://commons.wikimedia.org/wiki/File:Japaneseweaver.jpg) (accessed on 30th of September 2020)



THE LOOM



A type of manual horizontal loom with warp roller and heddles activated with the feet by the weaver (Cioară, 2008, 27)

- The next steps in the evolution of the horizontal heddle loom were: using the warp roller, placed in the back of the loom; the heddles activated by treadles; using the reel for beating the weft thread



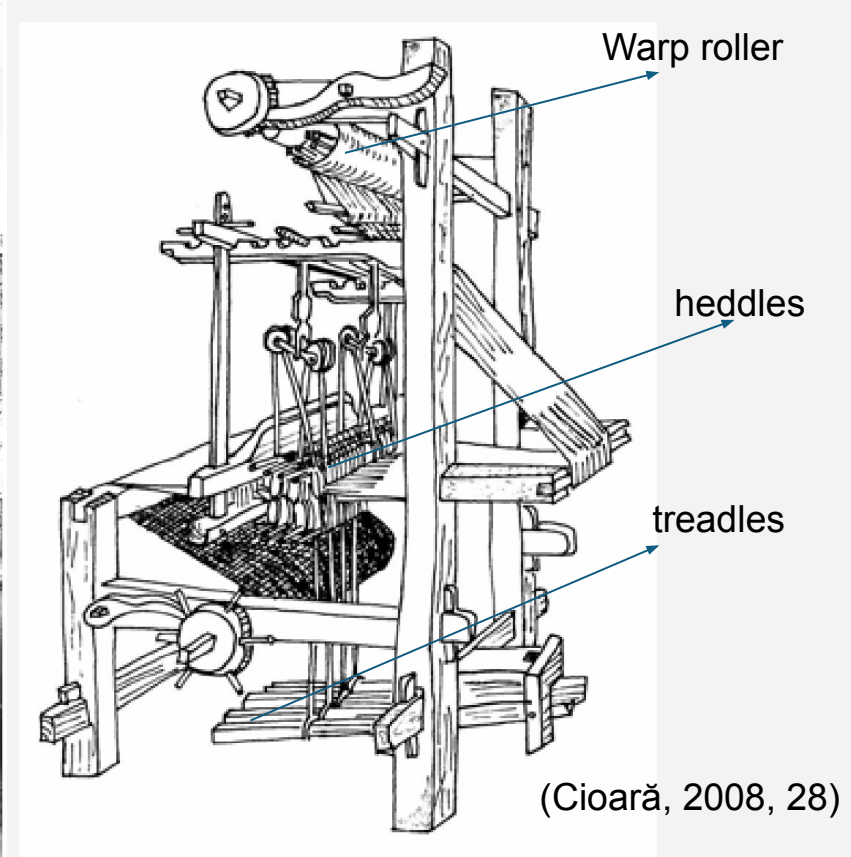
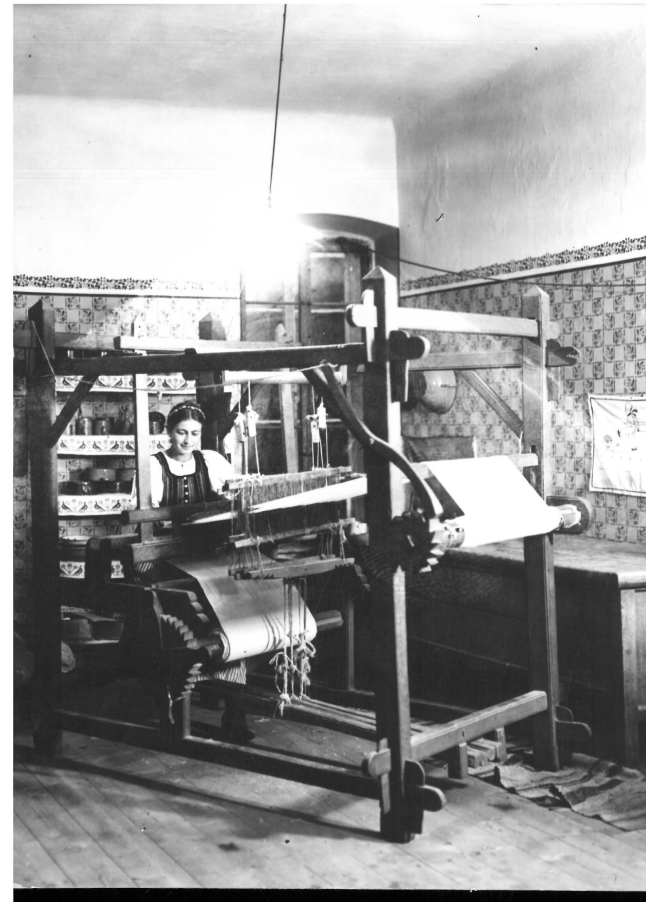
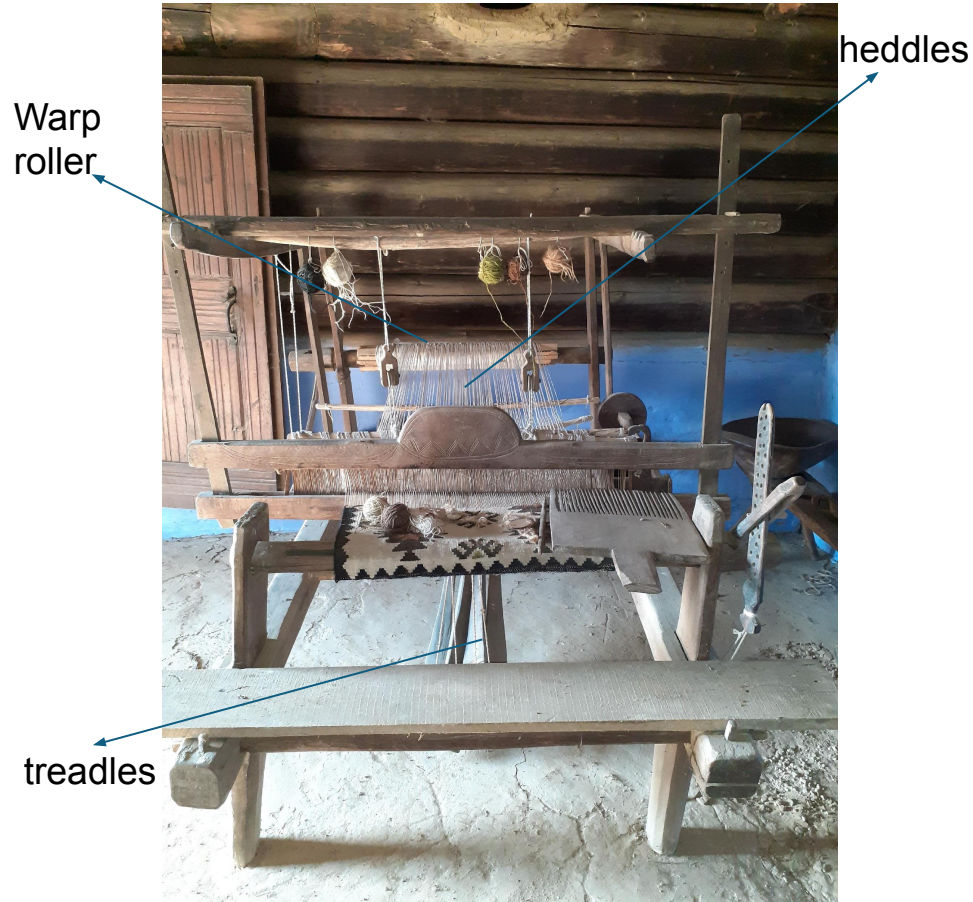
Main feature: assures the formation of the shed through lifting and descending the heddles tied and activated at the beginning directly with the feet by the weaver treadles. These type of loom is used even today by craftsmen



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THE LOOM



Types of manual horizontal looms



THE LOOM

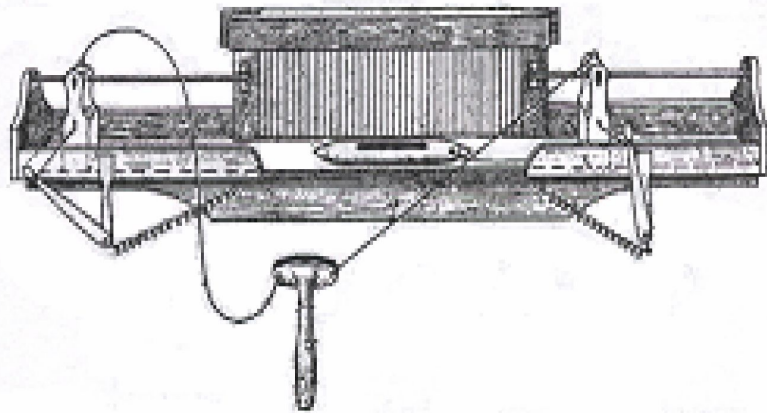
- During the Middle Ages and in modern times we can see the perfecting of the working techniques, of structure and manor of building the loom and, not lastly, a diverse span of textiles created.
- Specialized Crafting workshops are created or are developed. During the Middle Ages those workshops transformed this craft into an art through their unique style.
- During the 17th century a true textile industry is developed in the rural ares and gradually, thanks to the merchandise surplus, led to the emergence and development of exchange markets, local at first and later wider; it led to the specializing in a certain technique or in a product specific to a certain area/place/ village; specialized villages appear.
- The new improvements made to the manual looms lead to their mechanization due to the growth in of necessity and to the larger variety of textile products ➡ the emergence of mass production during the 20th century.



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THE LOOM



Manual device for operating the shuttle
(Cioară, 2008, 29)



Flying shuttle.
Source:

https://en.wikipedia.org/wiki/Flying_shuttle
(accessed at 23rd of September 2020)

The mechanizing of the manual horizontal loom

- 1678: a naval officer published a project for a loom, he claimed it could weave without human assistance
- 1733: John Kay invents the “flying shuttle” operated by the weaver with the help of strings and propellers
- 1760: Robert Kay invents the drop box which leads to diverse textiles by using different kind of weft threads



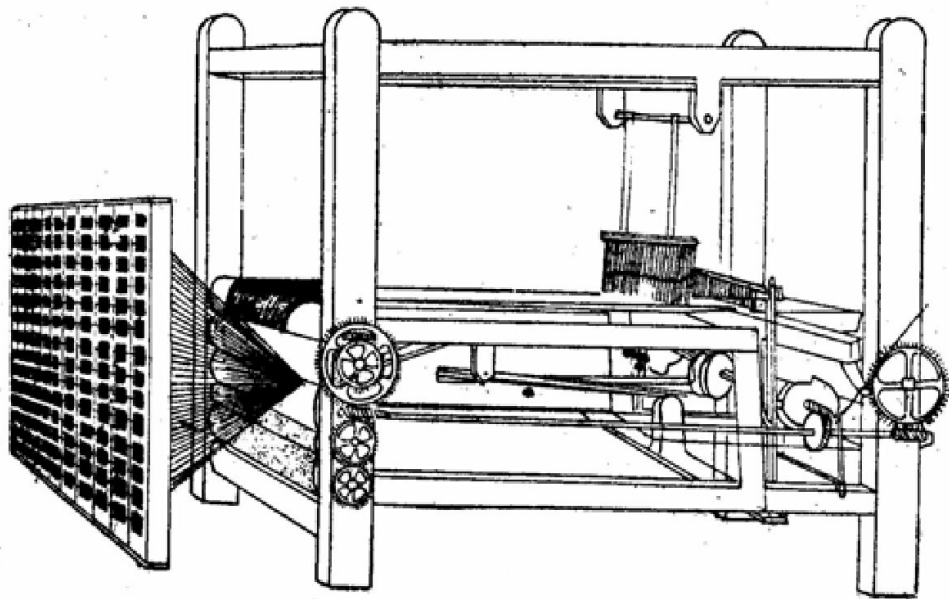
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THE LOOM

The mechanizing of the manual horizontal loom

- 1784: Edmond Cartwright invents the power loom that had the mechanism for creating the shed, the mechanism for inserting the weft thread by shuttle and the beating mechanism all synchronized
- 1789 James Watt and Matthew Boulton`s steam engine is added to the power loom
- Initially the power loom was operated through animal power, later by water or stream power and in the end it was the electrical power that made it work



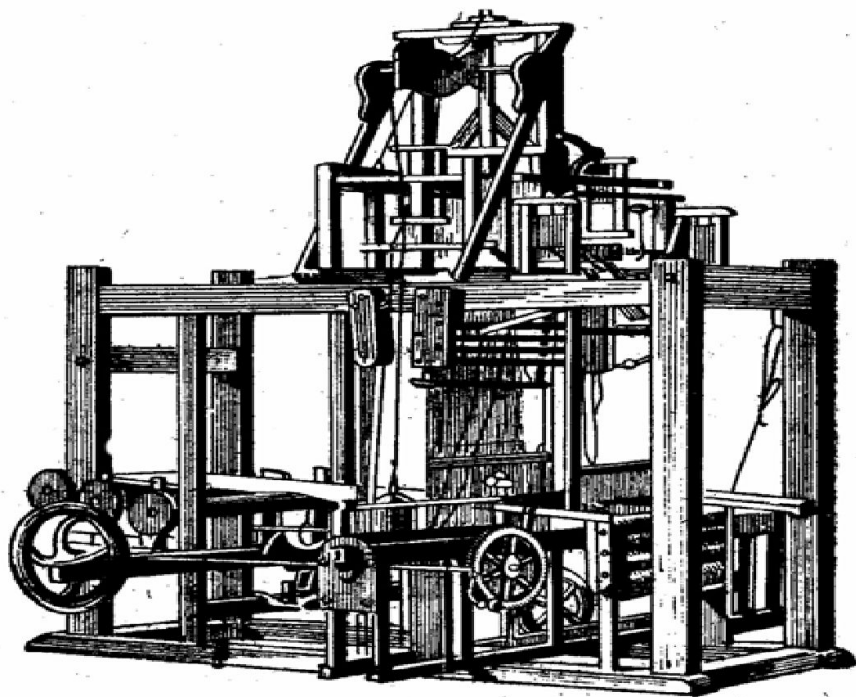
The blueprint of the first mechanical loom
(Cioară, 2008, 29)



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THE LOOM



Automatic loom with a Jacquard mechanism
(Cioară, 2008, 30)

The mechanizing of the manual horizontal loom

- 1801: during the Paris Industrial Exhibition the “Jacquard mechanism” was introduced. It was invented by Joseph Marie Jacquard.
- After 1820: the automatic loom spreads in the European countries

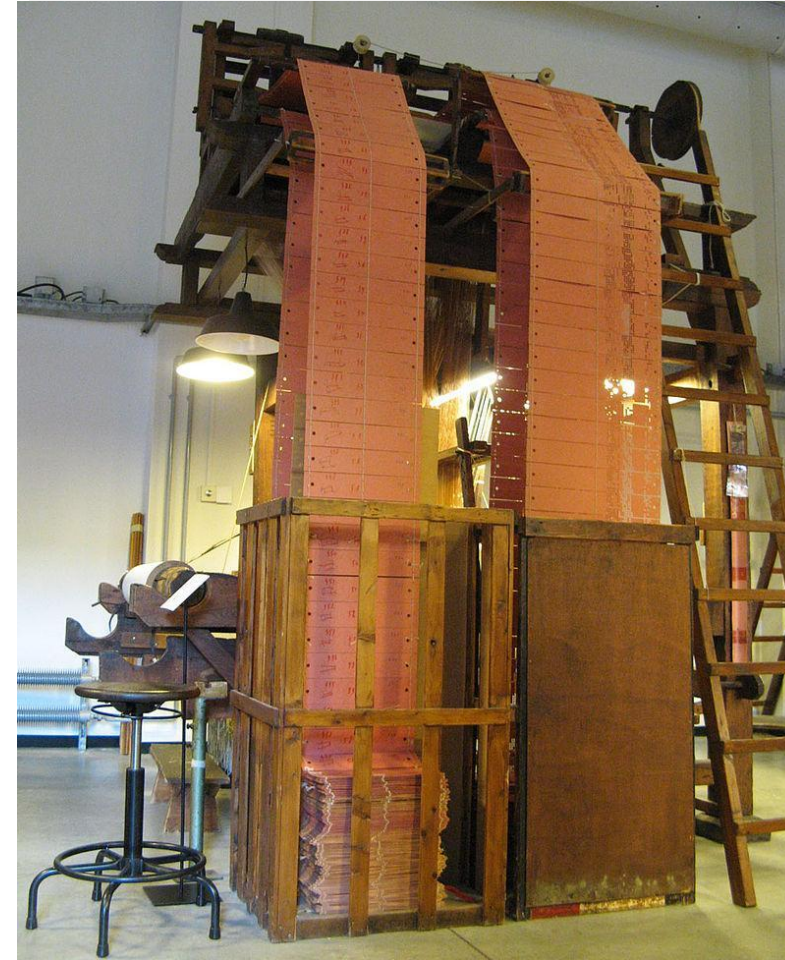


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THE LOOM

Carpet loom with
Jacquard apparatus by
Carl Engel, Nördlingen,
around 1860.



Detail of Jacquard
loom at
TextielMuseum
Tilburg, Netherlands

Source: https://en.wikipedia.org/wiki/Jacquard_machine



THE LOOM

The mechanizing of the manual horizontal loom

- 1920: the waved shed loom is invented; later on the multiphase machine appears
- 1922: the weaving machine where the yarn is hooked on one side by the giver (the Gabler system) is invented
- 1924: Rossmann patents the ballistic weft insertion, later used by Sulzer
- 1930: the Dewas system is patented; it meant the tip-to-tip transfer through the shed
- 1946: Masbo invents the weaving machine in which the weft is inserted by water or air jet
- Around 1950: new unconventional weaving techniques emerge based on diversifying the principles of weft threads insertion which causes an increase in productivity and efficiency of the weaving process
- Today you can find the following loom types: manual looms, classical horizontal looms with shuttle, manual vertical looms, mechanical, ballistic looms, air jet looms, water jet looms, multiphase looms



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THE LOOM



Air jet looms.

Source: <https://www.textilegence.com/en/picanol-omniplus-i-itma-2019/>



Water jet looms.

Source:

<http://ro.deketextilemachine.com/loom-machine/water-jet-loom/water-jet-loom-weaving-machine.html/>



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THE PARTS OF A VERTICAL LOOM

HOW TO ASEMBLE MANUALLY A VERTICAL LOOM

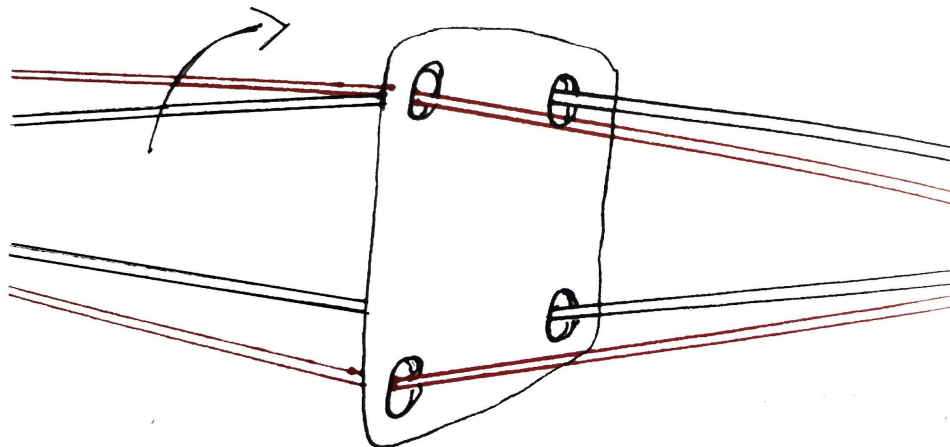
Documentary movie made with craftsman Rodica Ispas, Avrig, Sibiu county, Romania.



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TABLET WEAVING



Representation of tablet weaving.
(Zaharia, 2008, 64)

- The name comes from the usage of some square tablets, approximately 5 cm wide, that have holes in the corners which are rounded
- The tablets are made of different materials: wood, leather, bone, plastic or rigid cardboard
- The tablets support the warp threads which are inserted in the four holes
- Weaving technique: the tablets are turned and by each turning a shed is formed thus the weft thread can be inserted
- The number of cards required vary according to the design and the width of the woven material
- The design is entirely incorporated in the warp
- The technique is used in Europe since the Iron Age, a proof being the tablets found in Spain which date from approximately 400 BC (Hann, 2005, 34; Hansen, 1990, 11,14; Zaharia, 2008, 64)
- The technique was documented in Japan, China, Central Asia, India, Himalaya, Iran, Indonesia, Caucaz, Syria, Palestine, Egypt, North Africa, Turkey, Greece, Macedonia, Bosnia, Russia, Sweden, Norway, Iceland, France (Hann, 2005, 34; Schuett, 1956, 9)
- Materials: wool, goat hair
- Products: belts



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TYPES OF MANUAL LOOMS



Tablet weaving. Mariana Dimitrova, craftswoman from Plovdiv, Bulgaria, 2016.



THE HORIZONTAL LOOM

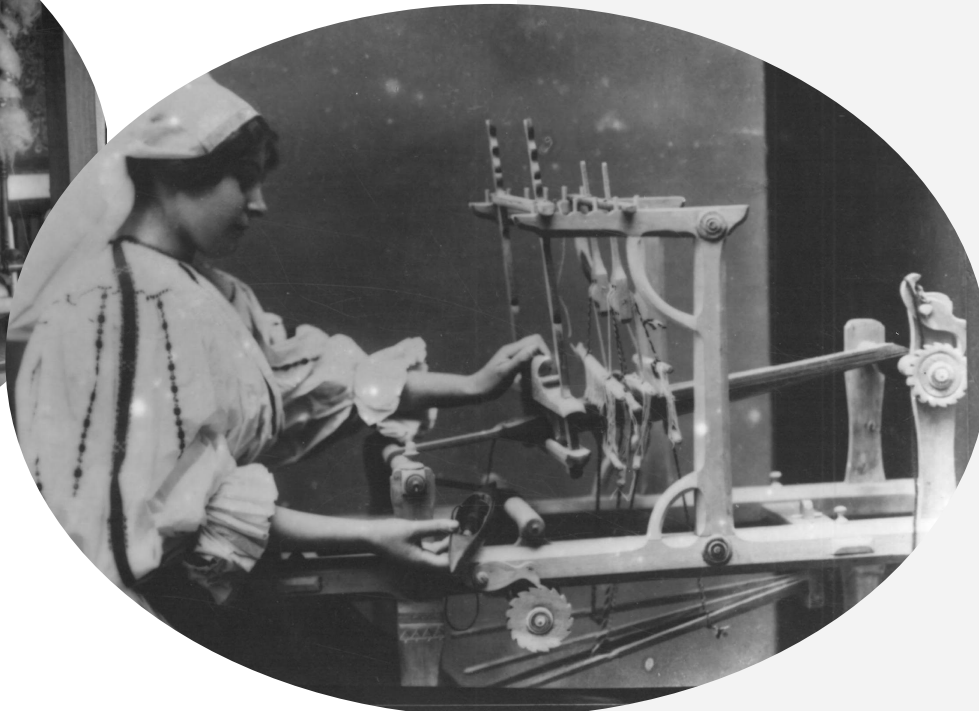
- characteristics:
 - ❖ The lifting of the heddles
 - ❖ The lifting of the frame of the reed
 - ❖ The tension of the warp on two bars one in front and one in the back of the loom
 - ❖ The shed is created and changed by pressing the treadles corresponding to each heddle
- It appears in different forms and shapes in accordance with: the place where it was kept, the material used for weaving (for hemp a longer loom was preferable) the type of textiles and their purpose
- It appears throughout Europe and beyond
- In the traditional village it was inherited and that is why a special care was taken to preserve it: it was kept in parts, away from humidity, on a straight surface to avoid the curving of the wood, its assembly was done only for the period in which the weaving took place in a closed area (home or shed)
- Parts: of the loom: can be taken apart; made of wood or wood and metal
- Loom is made by: a man in the family or by carpenters



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TYPES OF CLASSICAL HORIZONTAL LOOMS



ASTRA Museum`collections



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TYPES OF CLASSICAL HORIZONTAL LOOMS



Open Air Museum Copenhagen (Elena Gävan photo, 2013)



https://en.wikipedia.org/wiki/Loom#/media/File:Stelles_Sluti%C5%A1%C4%B7u_vectic%C4%ABnieku_lauku_s%C4%93t%C4%81.jpg



https://en.wikipedia.org/wiki/Loom#/media/File:The_Korkosz_Croft_in_Czarna_G%C3%B3ra_01.jpg



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TYPES OF CLASSICAL HORIZONTAL LOOMS



ETAR, Bulgaria, 2013 (Elena Găvan photo)



ASTRA Museum `collections. 1997



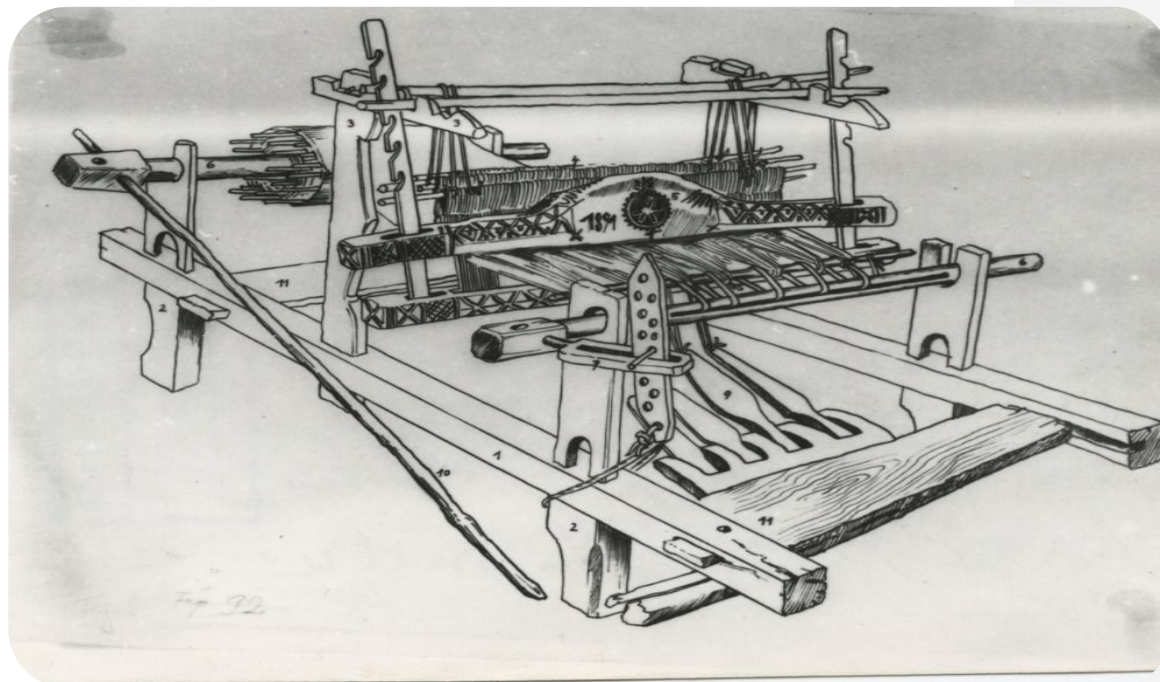
ASTRA Museum `collections. 2011



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THE DECORUM OF THE LOOM



- Decorations means to communicate and express feelings, the expression of the artistic gift of the carpenter or of the weaver; the loom's protection if it is placed inside a house, indoors.



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THE DECORUM OF THE LOOM

ASTRA Museum` collections.



- Upper reed decorative element



- Decorative elements: geometrical motifs, especially lines; motifs about the sky (stellar); vegetal motifs; inscriptions such as the carpenter's or weaver's initials; the year it was made.
- placed: on the bars, pulleys, in the angle made by the frame and bars
- The shape of the arms and supports is sometimes a decorative element.

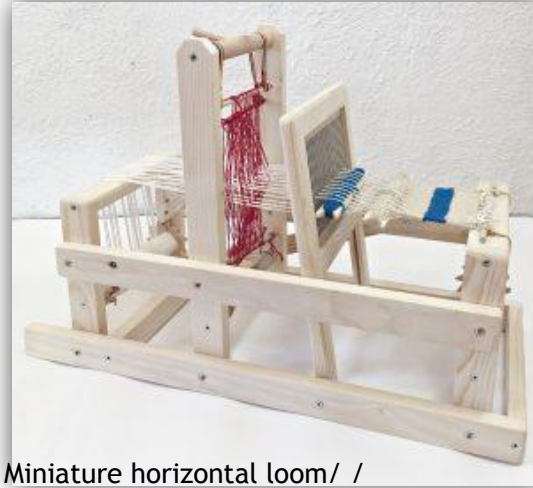


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TYPES OF LOOMS FOUND TODAY



Tapestry loom used for teaching



Miniature horizontal loom / /
<https://satulmestesugurilor.ro/produs/mini-razboi-de-tesut/>



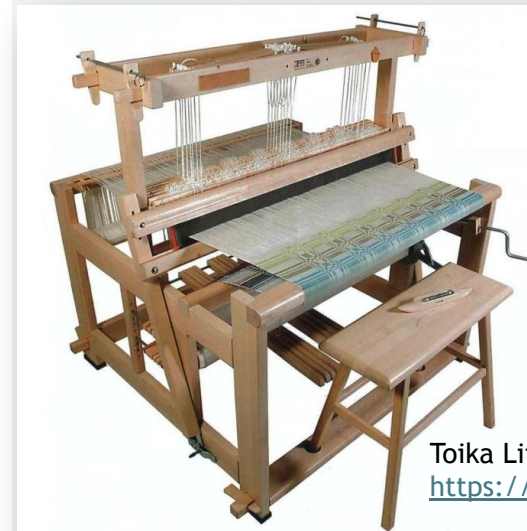
Miniature horizontal loom / /
<https://ro.pinterest.com/pin/778559854309683851/>



6 Treadles SAORI loom
<http://www.saorisantacruz.com/looms.html>



2 Treadles SAORI loom
<http://www.saorisantacruz.com/looms.html>



Toika Liisa loom
<https://woolery.com/toika-liisa-loom.html>



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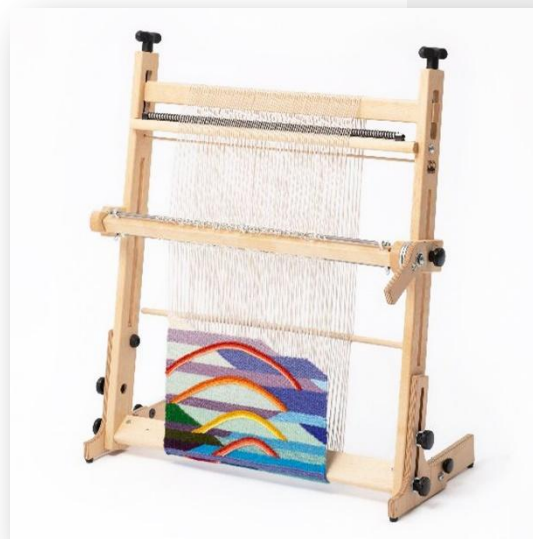


TYPES OF LOOMS FOUND TODAY



EMILIA Loom

<http://www.glimakrausa.com/emilia-13-in.loomheddle>



ARRAS Tapestry Stand Loom

<https://www.paradisefibers.com/products/arras-tapestry-loom>



SCHACHT 25 Tapestry Stand Loom

<https://www.eugenetextilecenter.com/schacht-25-tapestry-loom>



Different weaving techniques (1)

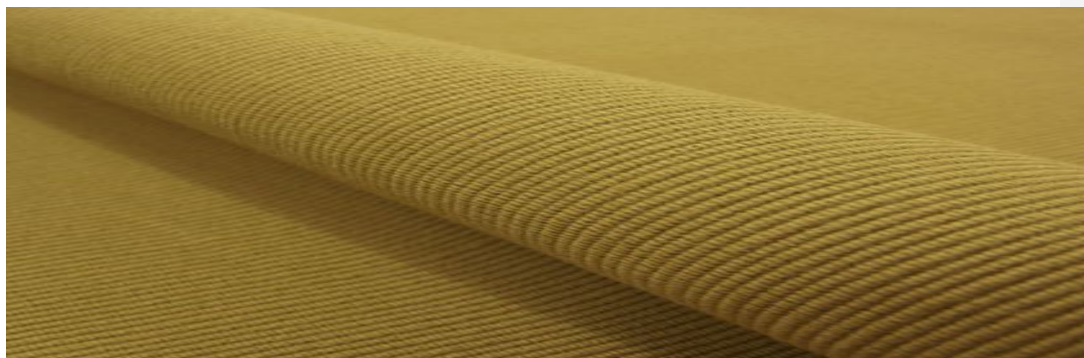
- Woven cloth can be *plain or classic* (in one color or a simple pattern) or can be woven in *decorative or artistic design*.
- The *weight and quality* of a woven fabric *depends on the weaving techniques* used.

The *plain weave produces lightweight* fabrics, like cotton and muslin.
Variations, like the use of many *different pieces of warp yarn*, instead of one that plain weave uses, leads to *different results in terms texture*.



Different weaving techniques (2)

- An example is the **rib weave**, which results from the use of a different, **thicker fabric for the weft**, compared to the warp and which creates a bulky texture and feel.



On the right: Hand woven fabric with coarse warp and delicate weft



Different weaving techniques (3)

- The **basket weave** is created by lacing two pieces of weft over-and-under two pieces of warp yarn, but may even use a *three-weft-three-warp* pattern, sometimes even a *four by four* one. The pattern may be emphasized through the use of different colors of the weft and warp.



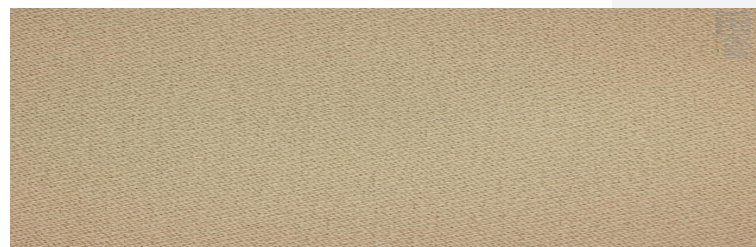


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Different weaving techniques (4)

- The **twill weave** is similar to the basket weave. It also uses *many threads, often three or four weft threads laced through two or three warp threads*. These threads are usually of *cotton*, while the pattern produced is **diagonal**, showing the blocks lined up in a slanted manner.

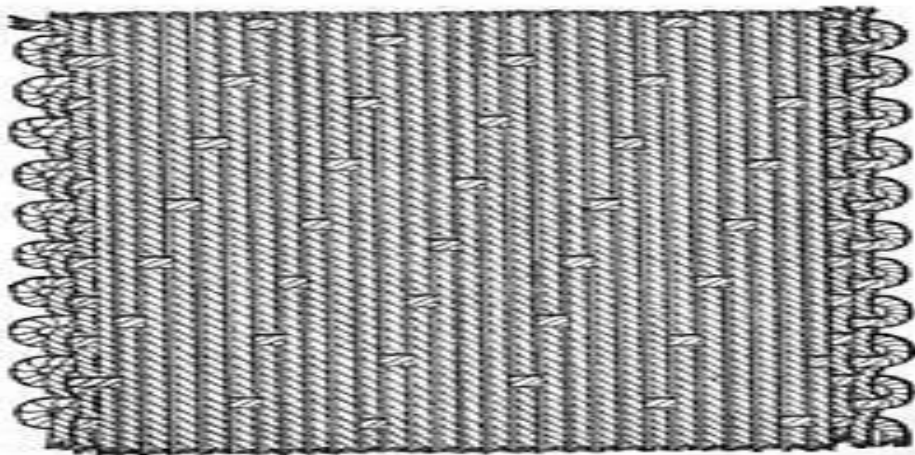


Left: woolen twill in the herringbone tweed pattern. *Center above:* cotton twill or chino.
Center below: A twill weave can be identified by its diagonal lines. This is a 2/2 twill, with two warp threads crossing every two weft threads. *Right:* Diamond twill, with weaving edge (left), blue warp, red weft.



Different weaving techniques (5)

- The **satin weave** leads the weft thread pass under four pieces of warp thread, but makes it go over just one piece of warp thread. Threads are usually of silk, while the fabric created is *delicate and loose*.



A satin weave, common for silk, in which, each warp thread floats over 16 weft threads.



Satin cloth



Sateen fabric

- Generally, the types of weave that require **equal ratios of weft and warp**, like the basket weave, create **sturdier cloth**, while the others, like the satin weave, create **softer and more delicate fabrics**.



Different weaving techniques (6)

- **Gauze weaving** creates thick, but *extremely lightweight* fabrics, which look *almost transparent*. The two different warp threads used are not necessarily parallel to each other and in some cases, may even be at such an angle that they become weft threads.
- The fabric produced is *versatile* and used for a variety of reasons, including medical ones (to dress up wounds), due to its durability and absorbency.



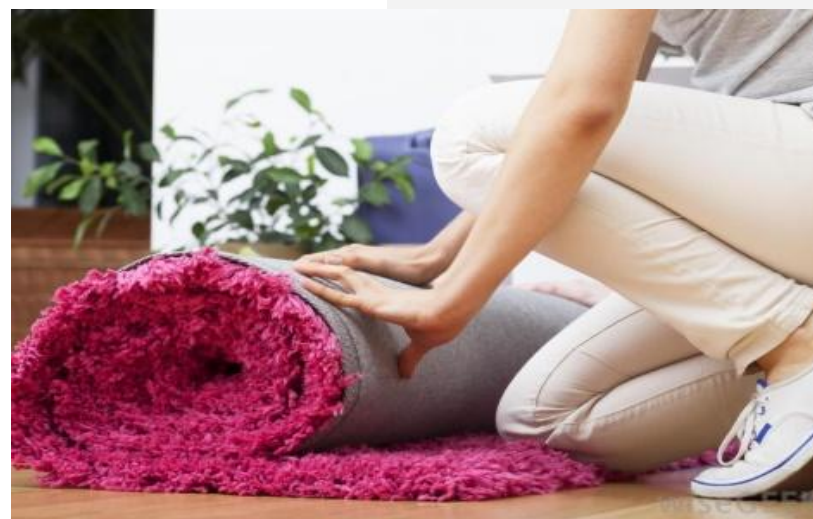


Different weaving techniques (7)

- Another favorite technique is the **pile weave**. Through this process, **three or more different layers** are developed, giving the fabric a *soft feel*. The textile produced is plush, yet resilient and is used to make velvet, corduroy, upholstery *cloth* and *carpeting*.



Chenille bedspreads



Shag carpet



Corduroy



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Different weaving techniques (8)

- *Wall-to-wall carpeting* is usually based on this weave that creates a soft feel under the feet and is easier to keep clean. *Area rugs* are still manufactured with such hand weaving techniques that were developed centuries ago.



Left: Carpet with coat of arms, made with cotton warp, silk weft and pile, as well as metal wrapped thread (Iran, 17th c.).
Center left above: Medallion, a common design in Persian carpets
Center right above: Carpet seller in India.
Right above: Weaver in Morocco.
Right below: Traditional rug being woven on a carpet loom.



Different weaving techniques (9)

- **Tapestry weaving** is elaborate, as it involves detailed images, which are produced by weft threads in a *variety of colors*. Images are placed behind the stretched warp threads and the weaver tries to match the image, using two weft threads at one time or separately, depending on the colour that needs to be created.



Tapestry yarn that's used in looms can be made of wool, silk, linen, and cotton fiber.



- Adanur, S. (2000). *Handbook of Weaving*. Sulzer.
[https://www.academia.edu/37898362/2000 Handbook of Weaving](https://www.academia.edu/37898362/2000_Handbook_of_Weaving)
- Barber, E. J. W. (1991). *Prehistoric Textiles*. Princeton University Press.
- Broudy, E. (2021). *The Book of Looms: A History of the Handloom from Ancient Times to the Present*. Waltham, Massachusetts: Brandeis University Press
- Buckley, C. (2019). *A World of Looms: Weaving Technology and Textile Arts*. Zhejiang University Press.
Available at:
[https://www.researchgate.net/publication/337902297 A World of Looms Weaving Technology and Textile Arts](https://www.researchgate.net/publication/337902297_A_World_of_Looms_Weaving_Technology_and_Textile_Arts)
- Eyring, S. (2020). *3-D Hand Loom Weaving: Sculptural Tools and Techniques*. Atglen, Pennsylvania: Schiffer Publishing Craft.
- Forbes, R. J. (1987). *Studies in Ancient Technology*. Volume 4. Leiden/New York: E. J. Brill.
- <https://www.britannica.com/technology/heddle-loom>
- <https://chs.harvard.edu/susan-t-edmunds-picturing-homeric-weaving/>
- https://www.youtube.com/watch?v=VcpW_zwDm0I
- [Types of Looms | Textile Weaving - YouTube](#)
- [https://www.youtube.com > watch](https://www.youtube.com/watch)
-



- Ellis, J. “What is a Loom?”. Available at: <https://www.infobloom.com/what-is-a-loom.htm>
- “Definitions for Weaving”. *The Web's Largest Resource for Definitions & Translations*. Available at: <https://www.definitions.net/definition/weaving>
- “Weaving Techniques || Weaving Plaid”. *The Weaving Loom*. Available at: <http://www.theweavingloom.com/weaving-techniques-weaving-plaid/>
- “Simple Strategies For Weaving Faster”. Nov. 4, 2020. Available at: <https://warpedfibers.com/weave-faster/>
- “The Dreamweaving Project - How to weave a tapestry”. Available at: <https://www.woolmark.com/fashion/diy/dreamweaving/how-to-weave-tapestry>
- McMahon, M. “What are Warp and Weft?”. Available at: <https://www.infobloom.com/what-are-warp-and-weft.htm>
- <https://en.wikipedia.org/wiki/Weaving>
- Ellis, J. “What is Weaving?”. Available at: <https://www.infobloom.com/what-is-weaving.htm>
- “Rib Weave”. *Woven and Knit B2B Fabric Marketplace*. Available at: <https://www.wovenandknit.com/article.html?for=blog&to=rib-weave&Id=1034>
- “Fun & Functional Beginning Basket Weaving”. *Creative arts Haywood Community College*. Available at: <https://creativearts.haywood.edu/event/beginning-basket-weaving>
- https://en.wikipedia.org/wiki/Basket_weaving



- Christensen, T. “What is Twill?”. Available at: <https://www.infobloom.com/what-is-weaving.htm>.
- <https://en.wikipedia.org/wiki/Twill>
- <https://en.wikipedia.org/wiki/Weaving>
- Uy, K. “What are the Different Types of Weave?”. Available at: <https://www.infobloom.com/what-are-the-different-types-of-weave.htm>
- “Gauze weaving”. *Etsy*. Available at: https://www.etsy.com/market/gauze_weaving
- Stamm, R. “What is Gauze Fabric?”. Available at: <https://www.infobloom.com/what-is-gauze-fabric.htm>
- Tatum, M. “What is a Pile Weave?”. Available at: <https://www.infobloom.com/what-is-a-pile-weave.htm>
- <https://en.wikipedia.org/wiki/Carpet>.
- Kmones, April 24, 2009. “Discover Berber Carpet Weaving Traditions of Morocco”. Morocco Customs & Traditions, Arts & Entertainment, Tours & Travel Tips, Moroccan Arts & Entertainment. Available at: <https://moroccotravelblog.com/2009/04/24/berber-carpet-weaving/>.
- “The richly woven tapestry” October 10, 2012. *The Imperceptible immigrant*. Available at: <http://www.theimperceptibleimmigrant.com/2012/10/10/the-richly-woven-tapestry/>
- Casanova, K. “Clasped Weft Weaving Step-by-Step Tutorial”. Available at: <https://kellycasanovaweavinglessons.com/2021/01/clasped-weft-weaving-step-by-step-tutorial.html>
- Gaar, M. “Clasped Weft Scarf”. *gist yarn*. Available at: <https://www.gist yarn.com/blogs/journal/clasped-weft-scarf>
- Grey, J., May 8, 2017. “Weaving: Experiments in Clasped Weft”. Available at: <https://medium.com/craft-mage/weaving-experiments-in-clasped-weft-74433b971ed5>



Sources of Photos

- Wilborn, C. “What is a Power Loom?”. Available at: <https://www.infobloom.com/what-is-a-power-loom.htm>
- “Choosing A Weaving Loom”. *Weft Blown*. Available at: <https://www.weftblown.com/pages/choosing-a-weaving-loom>
- Feagins, L. , March 11, 2013. “Maryanne Moodie · Woven Tapestries Shopping”. *The design files*.
<https://thedesigntapes.net/2013/03/maryanne-moodie-woven-tapestries/>
- “Beginning Tapestry Weaving”. *FAVA*. Available at:
<https://www.favagallery.org/classes/2019/06/28/beginning-tapestry-weaving>
- “Creative Weaving Techniques on the Rigid Heddle Loom”. *Schacht*. Available at:
<https://www.schachtspindle.com/creative-weaving-techniques-on-the-rigid-heddle-loom/>
- “3 Best Weaving Loom For Beginner That Are Easy to Learn”, Sept. 16, 2020. *The Beginning Artist*. Available at:
<https://www.thebeginningartist.com/beginner-weaving-loom/>
- Gaar, M. “Clasped Weft Scarf”. *gist yarn*. Available at: <https://www.gistyarn.com/blogs/journal/clasped-weft-scarf>
- https://en.wikipedia.org/wiki/History_of_clothing_and_textiles
- Wilborn, C. Available at: <https://www.infobloom.com/what-is-a-power-loom.htm>
- “What is Jacquard Fabric: Properties, How its Made and Where”. *Sewport*. Sept. 28, 2021.
Available at: <https://sewport.com/fabrics-directory/jacquard-fabric>
- “France Jacquard weaving”. *Textile design techniques*. Feb. 28, 2019. Available at:
<https://textiledesigntechniques.as.ua.Edu>
- *Talk about Fabric*. Available at: <https://www.talkaboutfabric.com/jacquard-origin-types>
- “Programming Patterns: The Story of the Jacquard Loom”. *Science + Industry Museum*. Available at:
<https://www.scienceandindustrymuseum.org.uk/objects-and-stories/jacquard-loom>
- <https://peggyosterkamp.com/wp-content/uploads/2013/10/Looms-Oh-My-1.jpg>
- <https://thumbs.dreamstime.com/b/modern-weaving-loom-22251311.jpg>

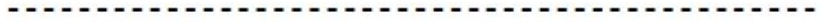


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EXAMPLES OF EXERCISES TO BE FINALISED SOON.....

1. Can you name the following pictures?



<https://www.gtreview.com/news/africa/renewed-funds-for-benins-cotton-season/>



<http://en.wikipedia.org/wiki/File:Wool.www.usda.gov.jpg>

2. Do you remember their origin?



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3a. What fibres can we use to make this shirt?



https://www.marni.com/hr/long-sleeve-jumper_cod1414617200.html#dept=kntwrds



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3b. What fibres can we use to make this bed linen?



<https://www.gettyimages.com/photos/bedding>



4. Do you remember some of the properties of the following fibres?

FIBRES	PROPERTIES
Cotton	
Linen	
Wool	
Silk	