CROSS WARP

Threads Crossing the Warp

MODULE 6

The loom and its parts, types of loom, weaving tools

ΙΔΡΥΜΑ ΚΡΑΤΙΚΩΝ ΥΠΟΤΡΟΦΙΩΝ IKY

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THE LOOM

- **The Loom** is the main tool utilized in making textiles and clothing pieces out of vegetal and animal fibres. Today we consider it to be a true working tool.

ASTRA Museum, 2013

ASTRA Museum, 2005

- **The Loom** must be seen as a real system, a collection of elements with different functions that have the same purpose: creating the textile

WEAVING?

WEAVING is the process of intertwining two or more threads placed perpendiculary on top of each other and its purpose is the creation of a cloth.

THE STRUCTURE OF THE CLOTH is the result of the intertwining in a precise order of two main sets of threads called warp and weft.

WARP is the total number of high quality textile fibres, equal in lenght and tension paralelly tied on the top and bottom bars of the loom. The warp represents the lenght of the cloth and it has a fixed position during the weaving process. The moving of the warp threads consists in dividing it in two rows while creating the shed through which the waft thread is inserted with the help of a shuttle or by hand. The tension of the warp is essential: without an equal tension you cannot weave; if it is overtensed threads could break and it would be more difficult to insert the weft; if it undertensed inequality on the surface of the textile coul appear.

WEFT, as oposed to the warp, represents the threads inserted transversally with a shuttle or by hand in each shed. The weft represents the width of the textile.

A SHORT HISTORY OF THE LOOM

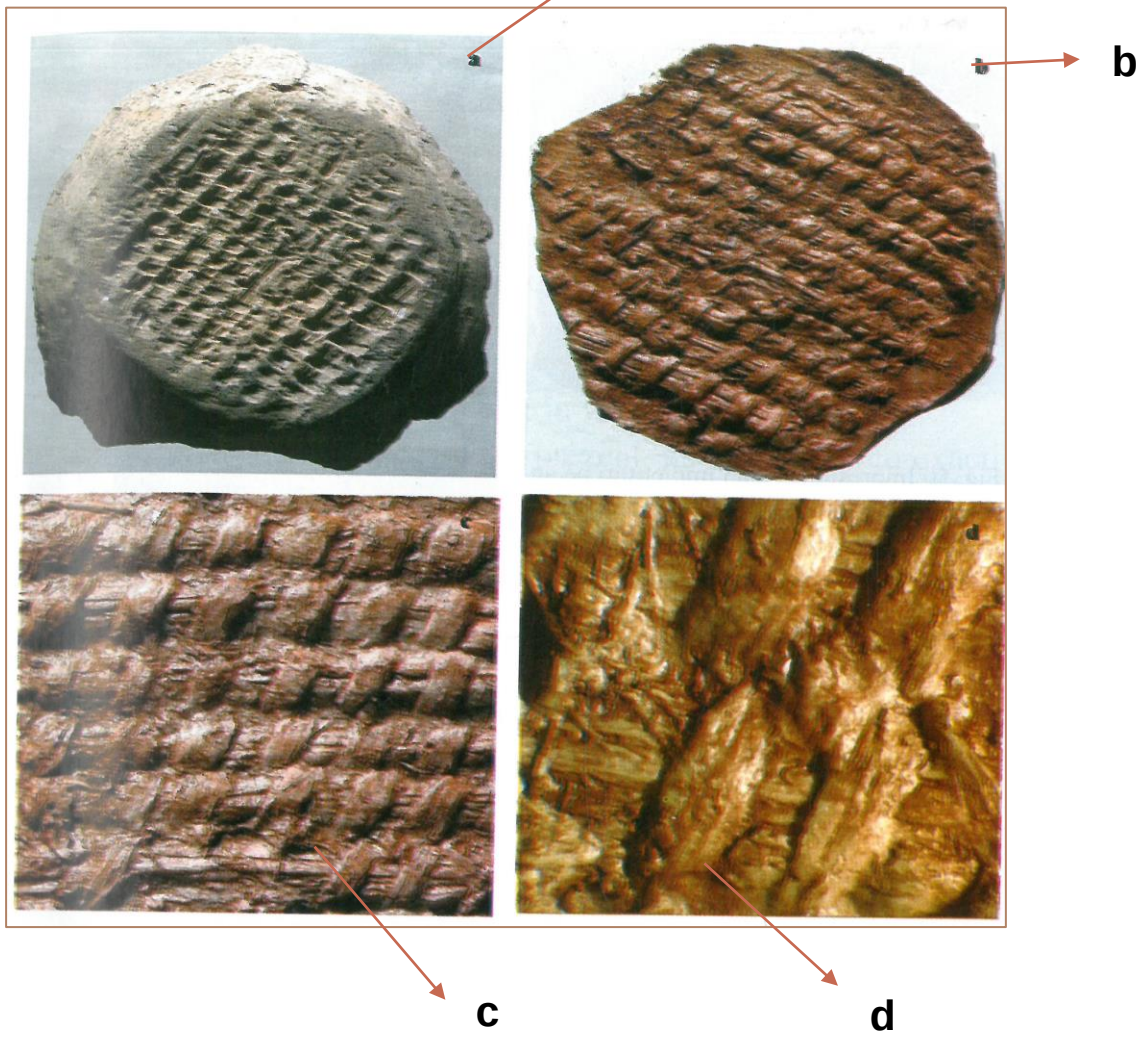
- Humankind history is tied to the history of the technique.
- Thanks to the technique, rudimentary at first and more and more refinde along time, people from different historic epochs made it easier to work, started to produce and imporved their lifestyle, the materials and their spiritual conditions.
- The most remarkable techniques of the past are usually the result of many experiments that could not be tied to only one person.
- The textile technique originates from the intertwining technique, the first technique used by the first humans to create fences out of twigs, baskets, hunting traps and especially fishing nets. In its turn weaving is said to have originated from the imitation of the surrounding nature.
- The creation of the loom, rudimentary at first, represents one of the oldest human inventions and it is considered to have a special meaning: it solves one of the most elementary human need that of protecting its own body against natural phenomena (cold, heat, rain, wind).

A SHORT HISTORY OF THE LOOM

- The archeological reseraches of different sites, places, salt mines, caves, etc., revealed artefacts such as spindles, weights, reels, needles, ceramic pieces with textile markings and even textile fragments that atest the existence, usage and evolution of the techniques used in creating textiles in prehistory (Upper Paleolithic period).

Loom weights of various shapes, belonging to the *Cucuteni-Trypillian culture* (5.200-3.200 B.C.). (Marian, 2009, 49)

A SHORT HISTORY OF THE LOOM



Impression of a basketry on a potsherd found in Costești, Republic of Moldavia. *Cucuteni-Trypillian culture* (5.200-3.200 B.C.).
(Marian, 2009, 69)

a. Potsherd
b. The cast of the potsherd ceramic
c. - d. The cast of the potsherd – details

A SHORT HISTORY OF THE LOOM

- The first study of the weaving techniques lacks information due to the fact that the materials used in creating some tools (wood), or the secondary fibres used are perisable being of vegetal or animal fibres. At first, the fibres were gathered from the surrounding nature without being treated against the passing of time. Such materials were: bundles of grass, cattail, weed, roots, twigs, leather, wool, hair, fur.

- The evolution stages of creating textiles: **SEWING, INTERTWINING, WEAVING.**

- The **ABOVE-UNDERNEATH-ABOVE** techinique is based on the same process that defines the weaving technique after the discovery of the processing of raw materials in order to obtain fibres.

- Differences: **INTERTWINING** → the raw material is shorter; rigid; predifined shape of the object

  WEAVING → the raw material is longer; higher degree of flexibility; finite products with higher functional traits

A SHORT HISTORY OF THE LOOM

- The research of the weaving tools' evolution was based on tieying the archeological evidence with the ethnographic information concerning the built of contemporary looms.
- The archeological, antropological 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.

A SHORT HISTORY OF 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 intertwing 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, reffered to in the specialized literature as devices/ weaving systems/ primitive looms, from the prehistoric era.

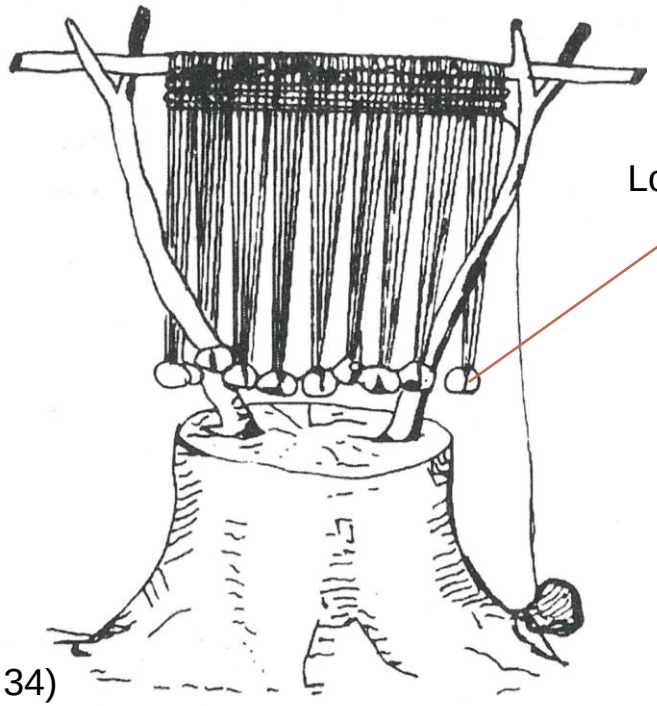
A SHORT HISTORY OF THE LOOM

Experiment of weaving when the warp threads are placed vertically (Olofsson &Nosch, 2015, 122) https://www.academia.edu/37599650/Test_of_loom_weights_and_2_2_twill_weaving (accessed on September 15, 2020)

Vertical weaving tool with weights/ Warp weighted loom.

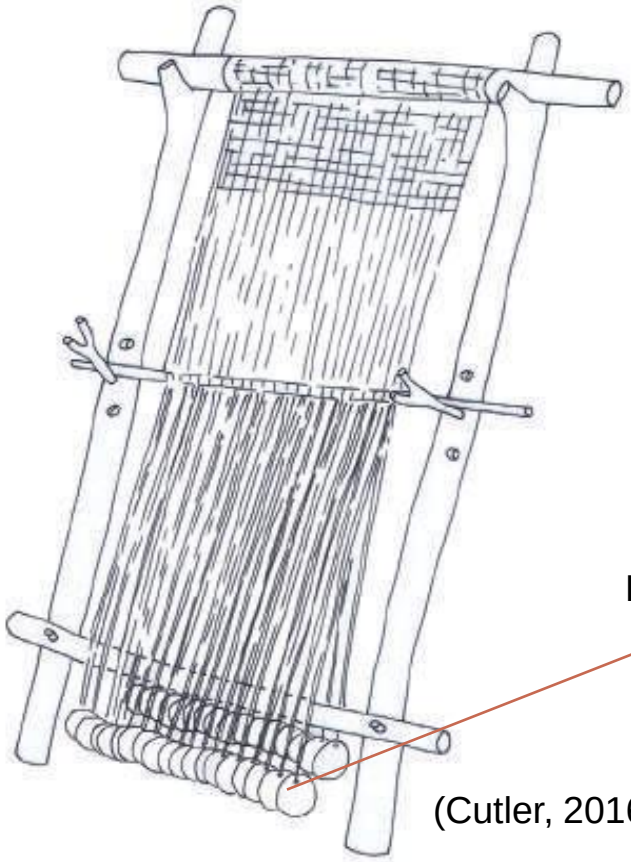
- The warp threads are placed vertically
- The upper ends of the warp threads are tied to a bar which is horizontally supported by two vertical bars tied to the ground
- The bottom ends of the warp threads are grouped in bunches and are tied to wieghts made of clay or rock which assure the verticality and the tension of the warp.
- The weaving process starts from the upper part and that is why the beating of the weft threads was made from the bottom towards the upper part

A SHORT HISTORY OF THE LOOM



Loom weights

(Marian, 2009, 34)

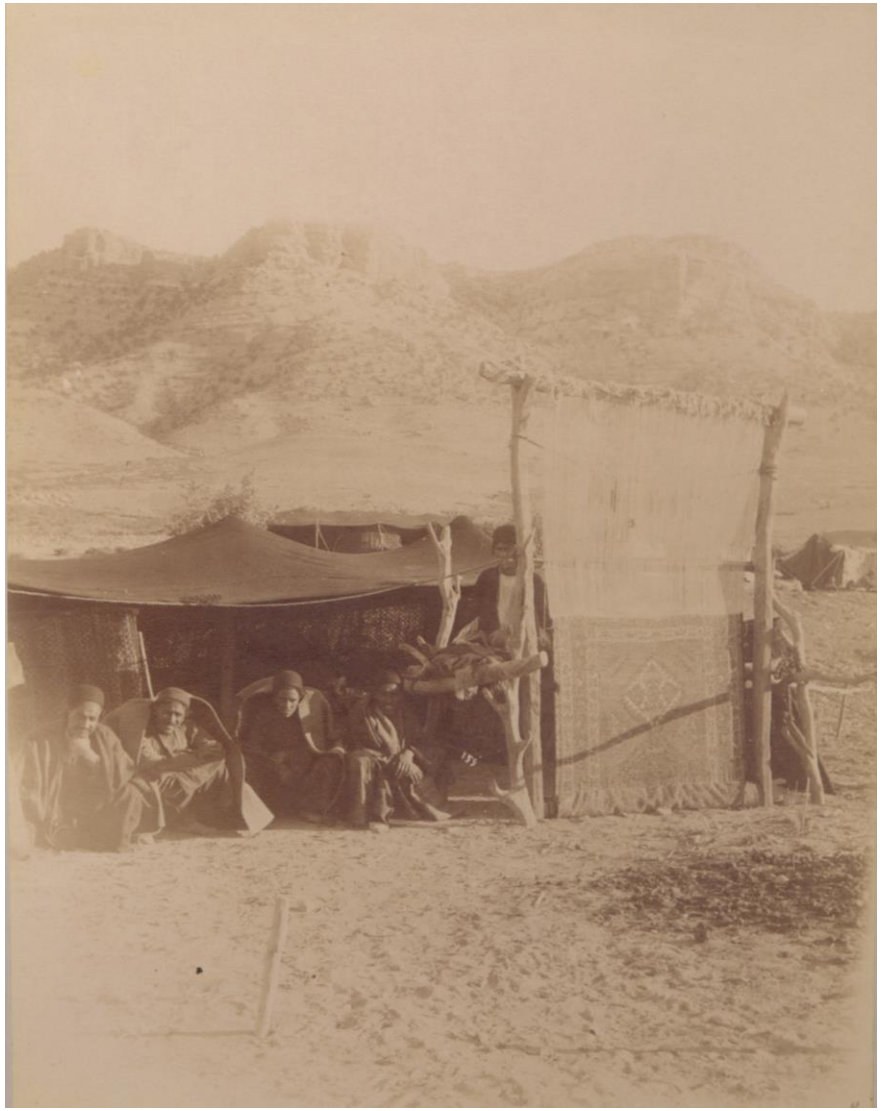


Loom weights

(Cutler, 2016, 96)

Representations of a warp - weighted looms with a fixed position

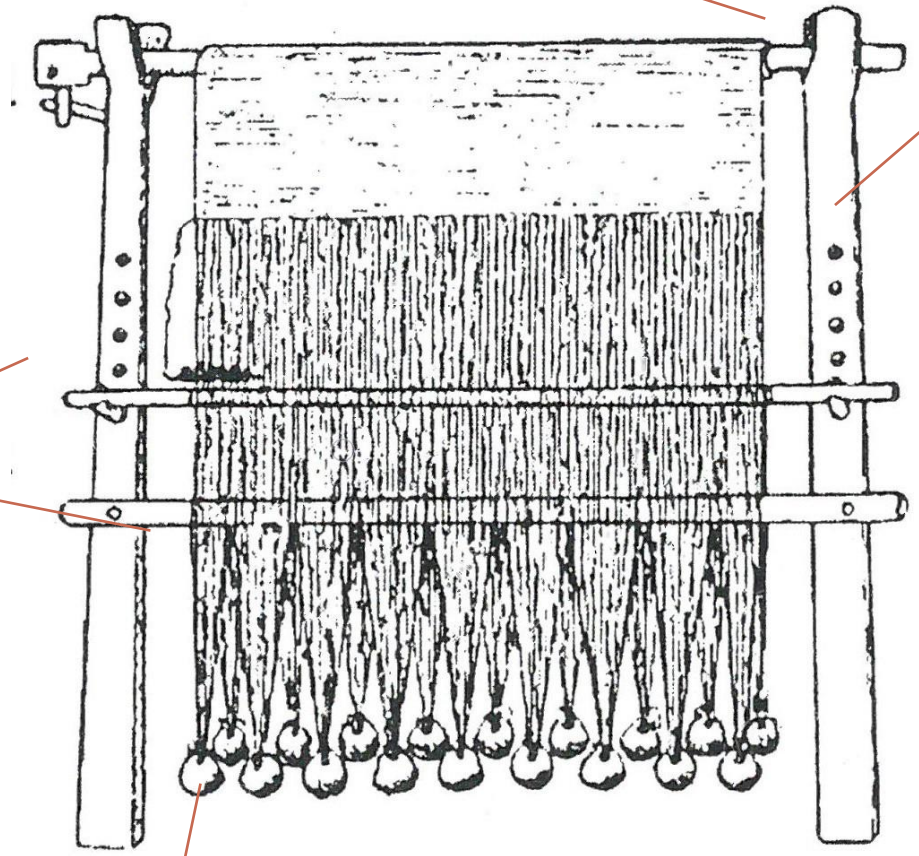
A SHORT HISTORY OF THE LOOM



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.

A SHORT HISTORY OF THE LOOM

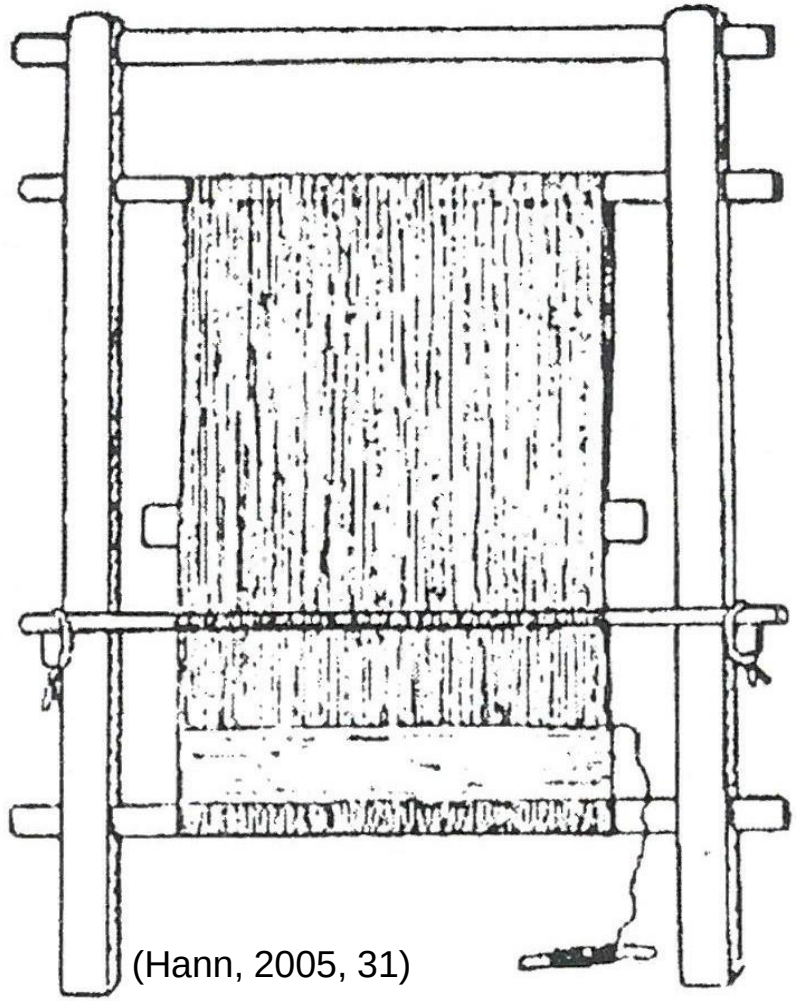


(Hann, 2005, 31)

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 wieghts found in archeological sites across Europe.

A SHORT HISTORY OF THE LOOM



(Hann, 2005, 31)

The vertical loom with two crossbars

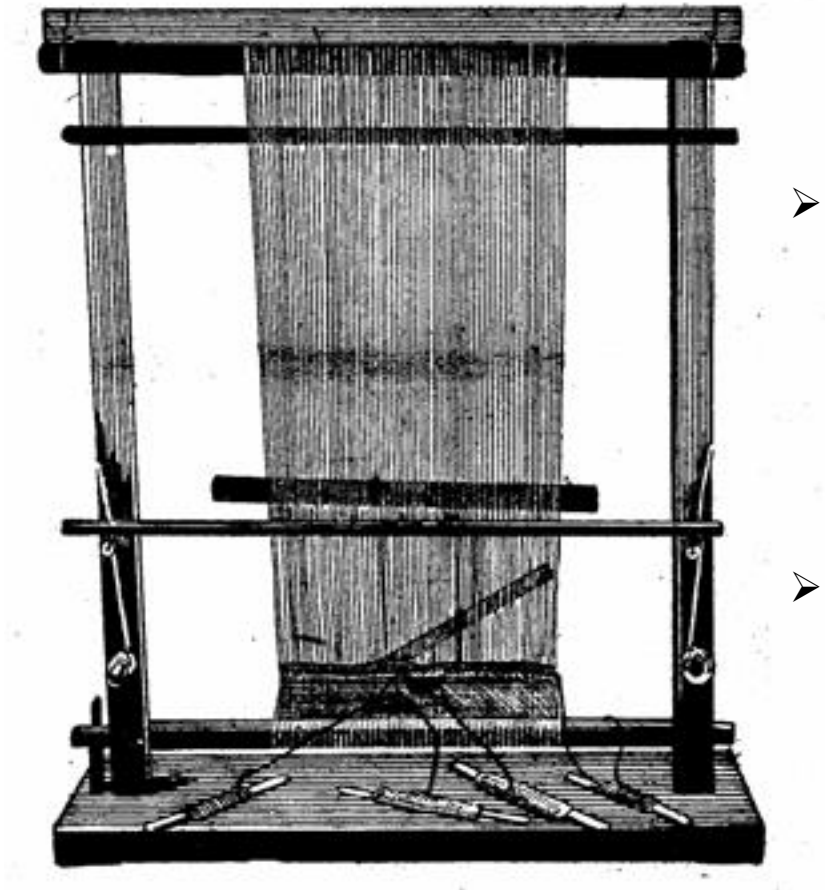
- It is considered to be the first simple vertical loom
- Consists of: two wooden pillars tied to the ground on one end and are united by crossbars
- The warp threads are spread across the upper and the lower bars, thus ensuring the tension of the warp threads, essential for weaving
- The weft is made 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

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

A SHORT HISTORY OF THE LOOM

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.

A SHORT HISTORY OF THE LOOM



Model of tapestry loom (Cioară, 2008, 25)

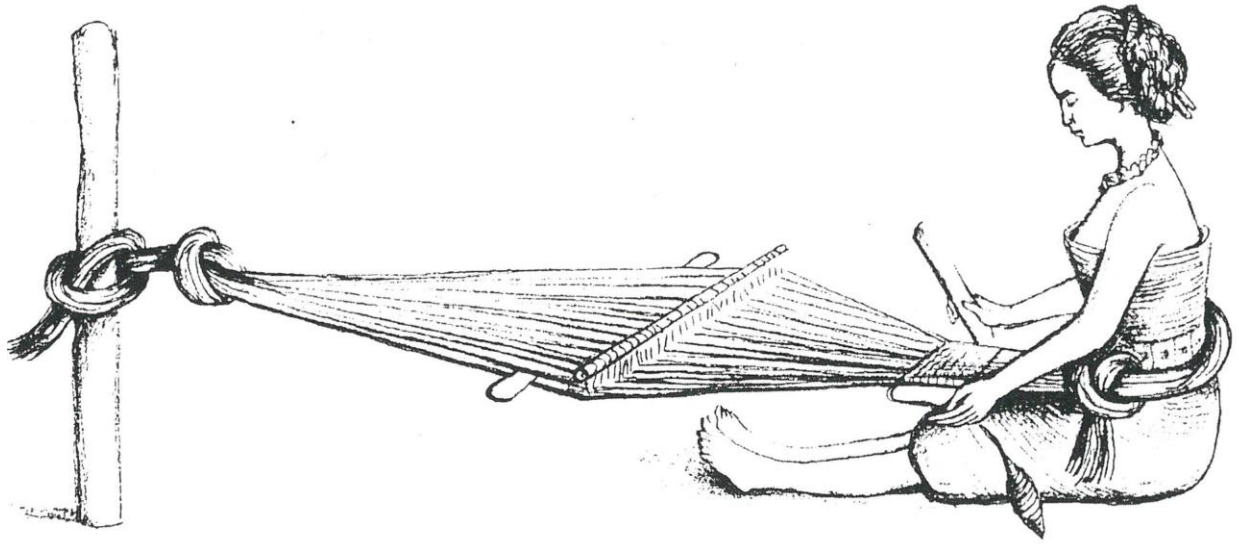
- This transformation allowed the grouth of the number of warp threads and the beating of the weft became more precise (Zaharia, p. 60)
- These type of loom is similar to the loom used today in tapestry in Europe and beyond

Digital photo collection of the ASTRA Museum, Sibiu, Romania.

A SHORT HISTORY OF 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

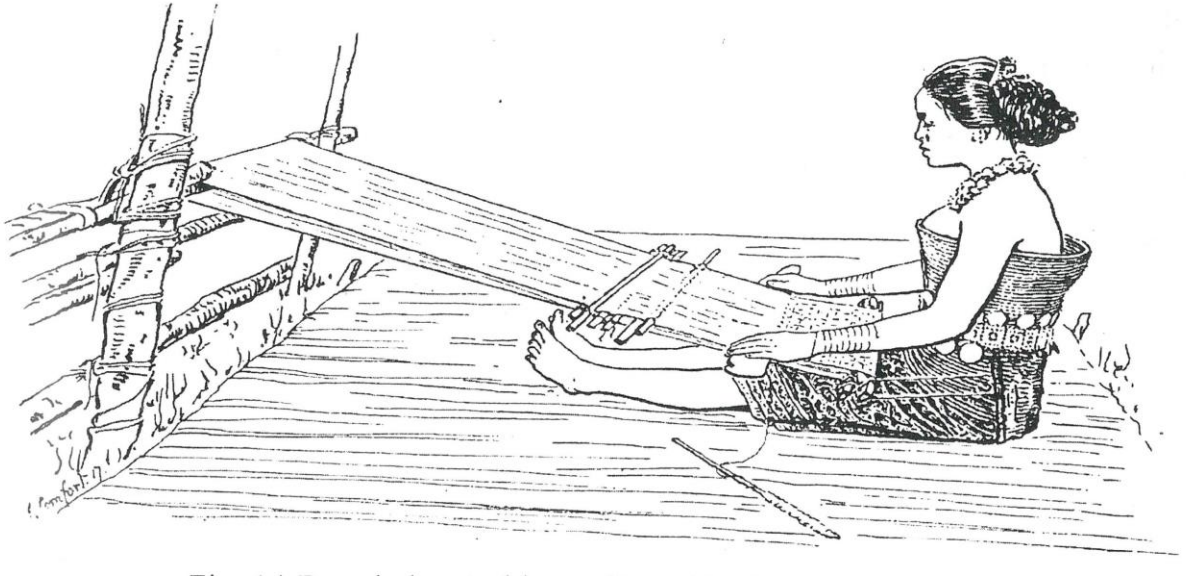


Woman working at a band loom (Marian, 2009, 32)

A SHORT HISTORY OF THE LOOM

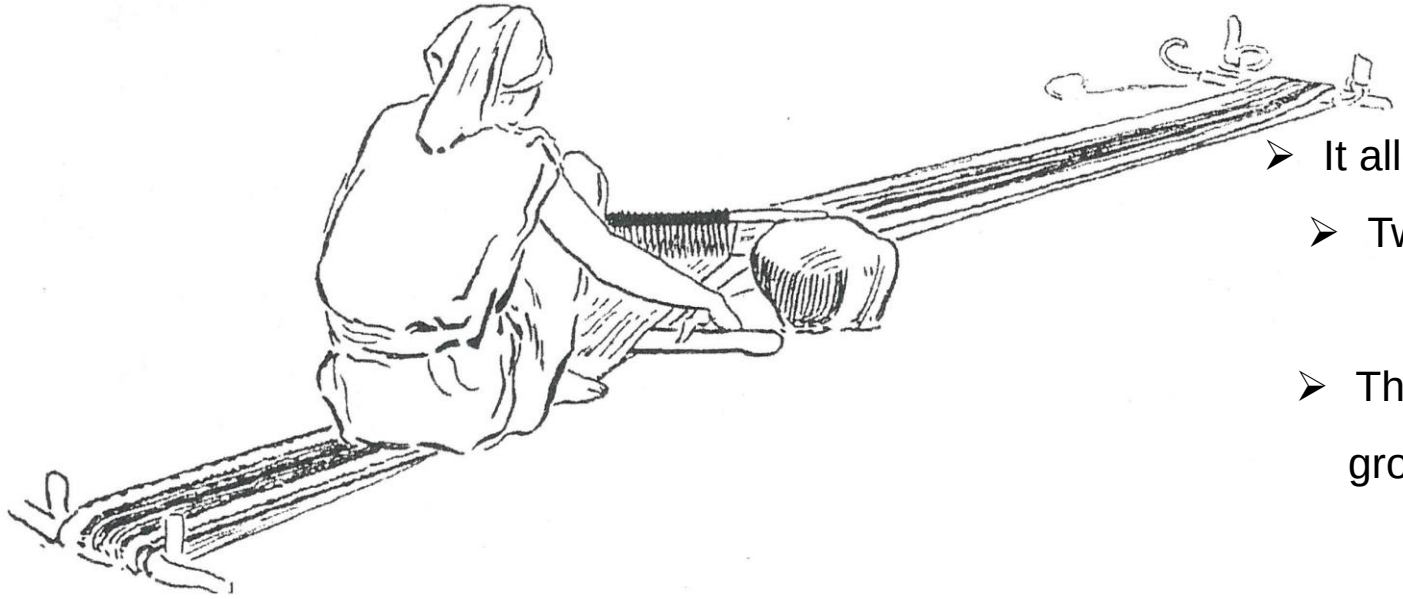
Backstrap Loom attached to the waist of the weaver

- A larger number of warp threads is used; the threads are distributed on a longer lenght
- The ends of the warp threads are tied, individually or in groups, on a bar equal in lenght 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)

A SHORT HISTORY OF THE LOOM

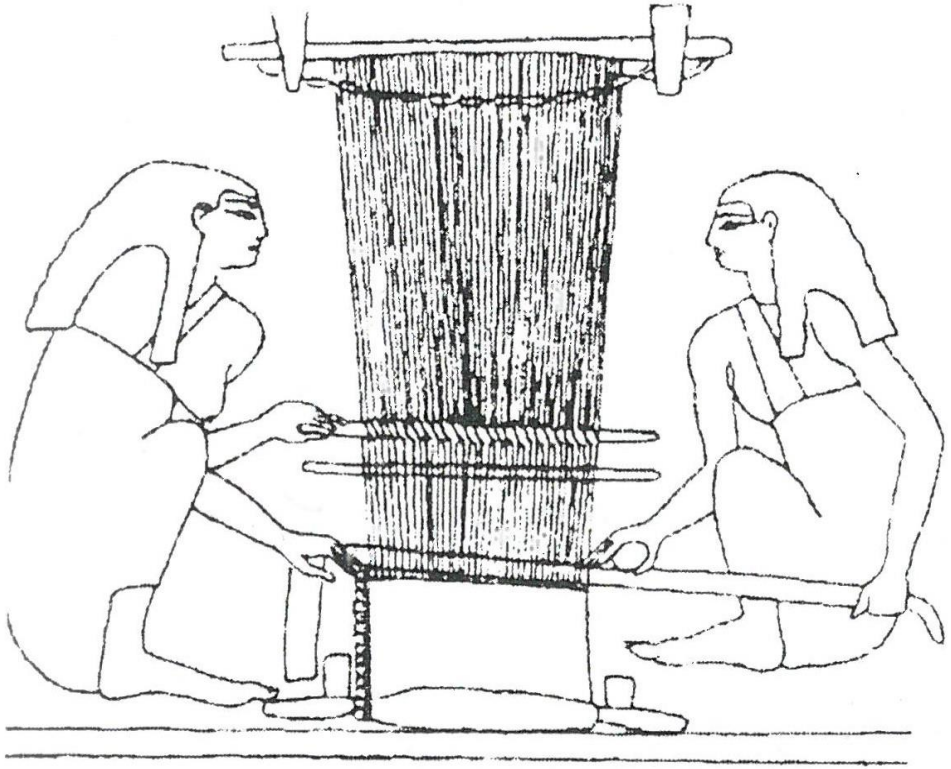


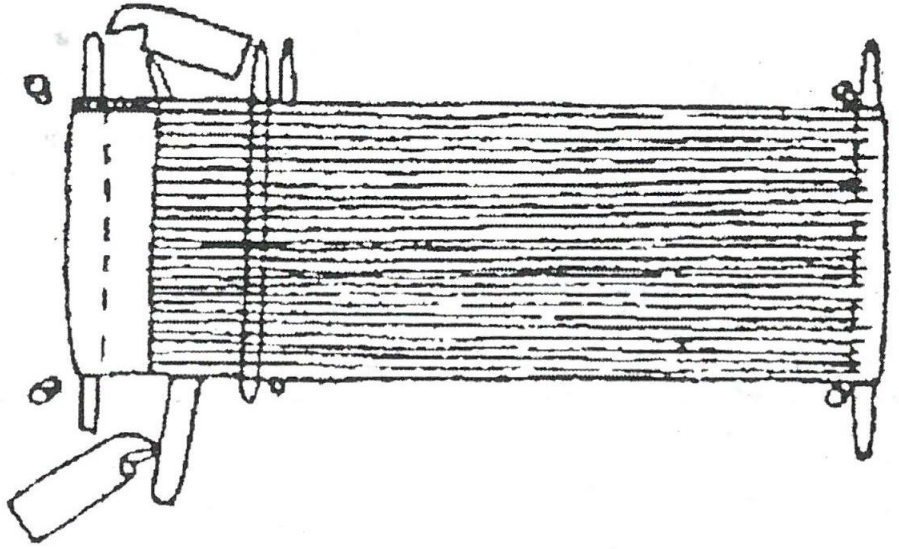
Woman working at a horizontal ground loom
(Roth, 1918, 46)

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 oposite ends of the cloth
- The ends of the warp threads are tied, individually or in groups, on a stiff bar equal in lenght to the lenght 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.

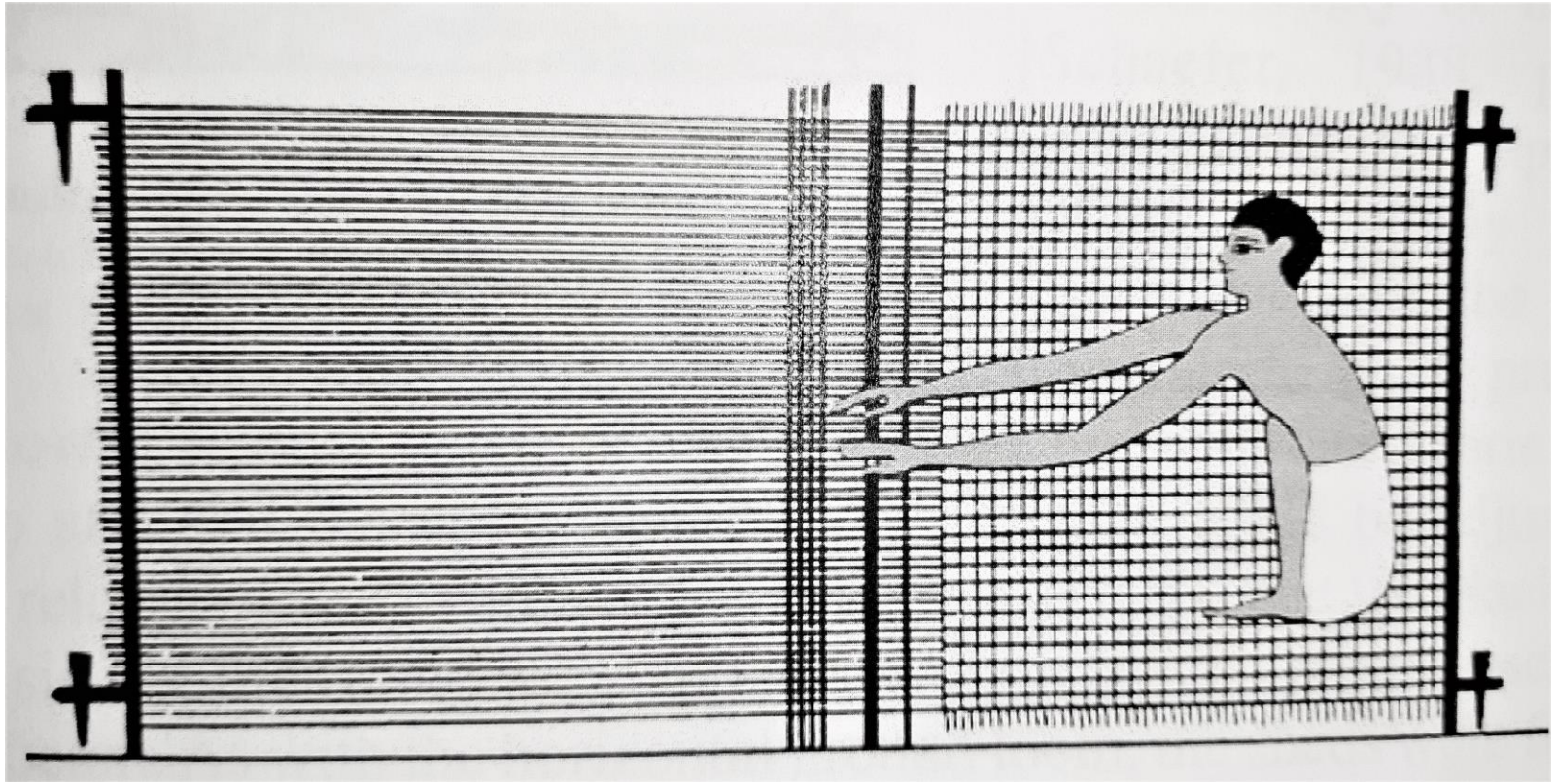
A SHORT HISTORY OF THE LOOM





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 prespective of objects which imposed the representation of all the components. (Hann, 2005, 28)

A SHORT HISTORY OF 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)

A SHORT HISTORY OF THE LOOM

- The horizontal loom most likely develops in parallel with the vertical loom

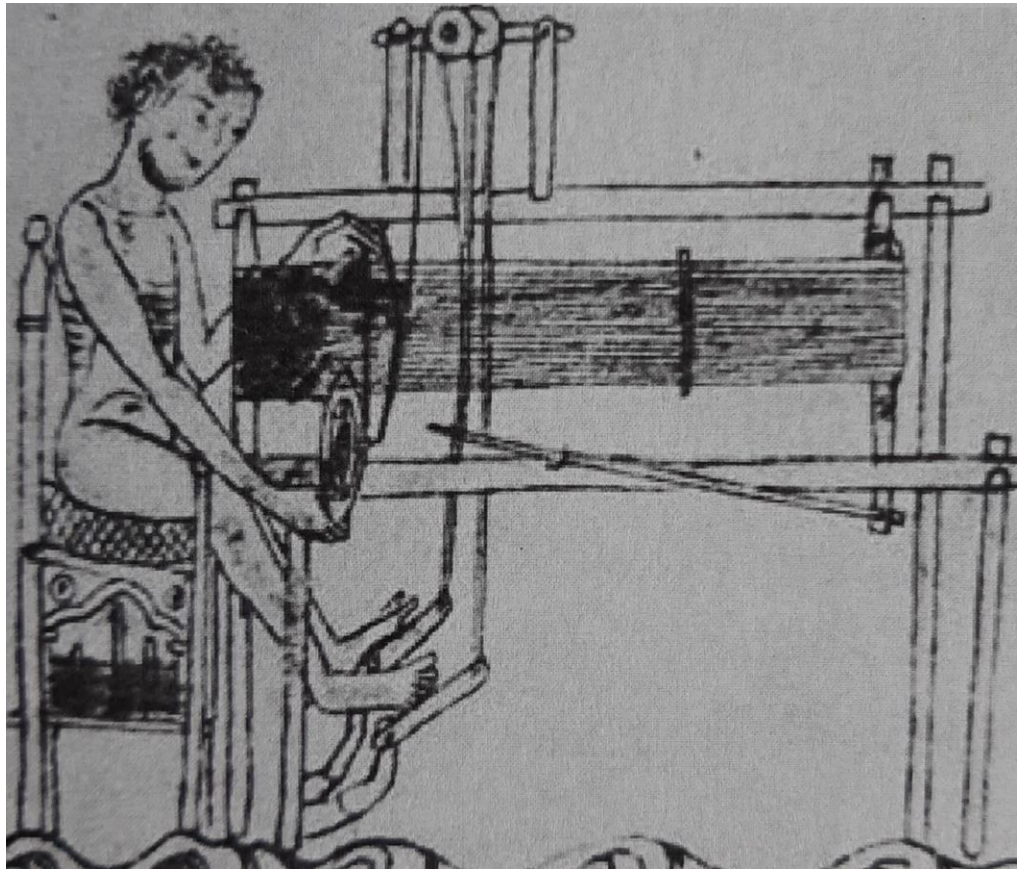
- The horizontal positioning gave it multiple developments posibilities: first it was raised from the ground either by means of a tripod-type frame that supported the warp stretching system or on a rectangular frame; new beams appear; the warp stretches from the back to the front where the woven cloth 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.

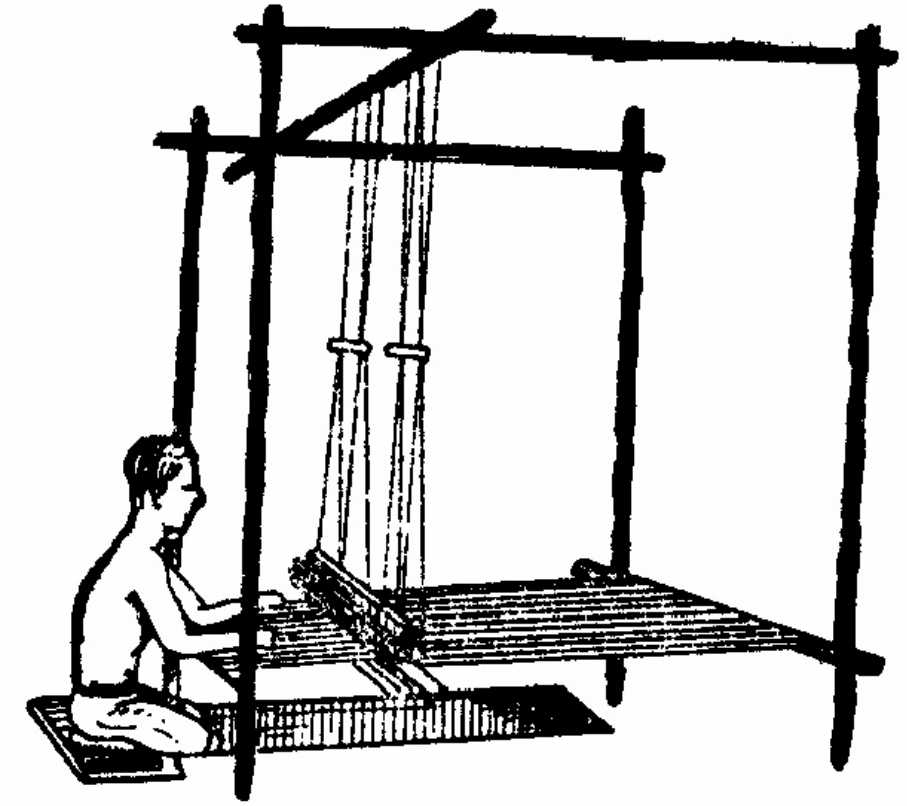
A SHORT HISTORY OF THE LOOM



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)

A SHORT HISTORY OF THE LOOM

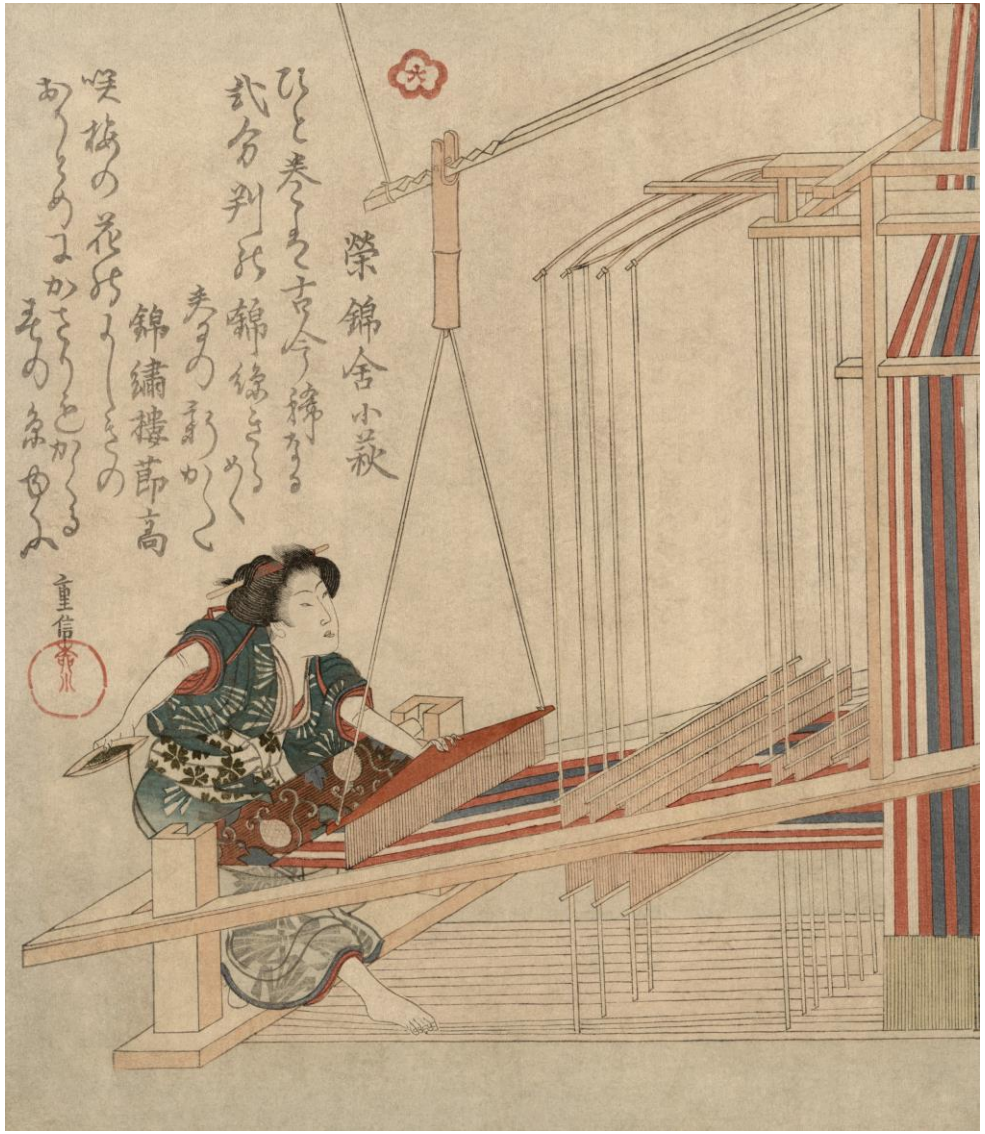


The buried manual horizontal loom.
(Cioară, 2008, 27)

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

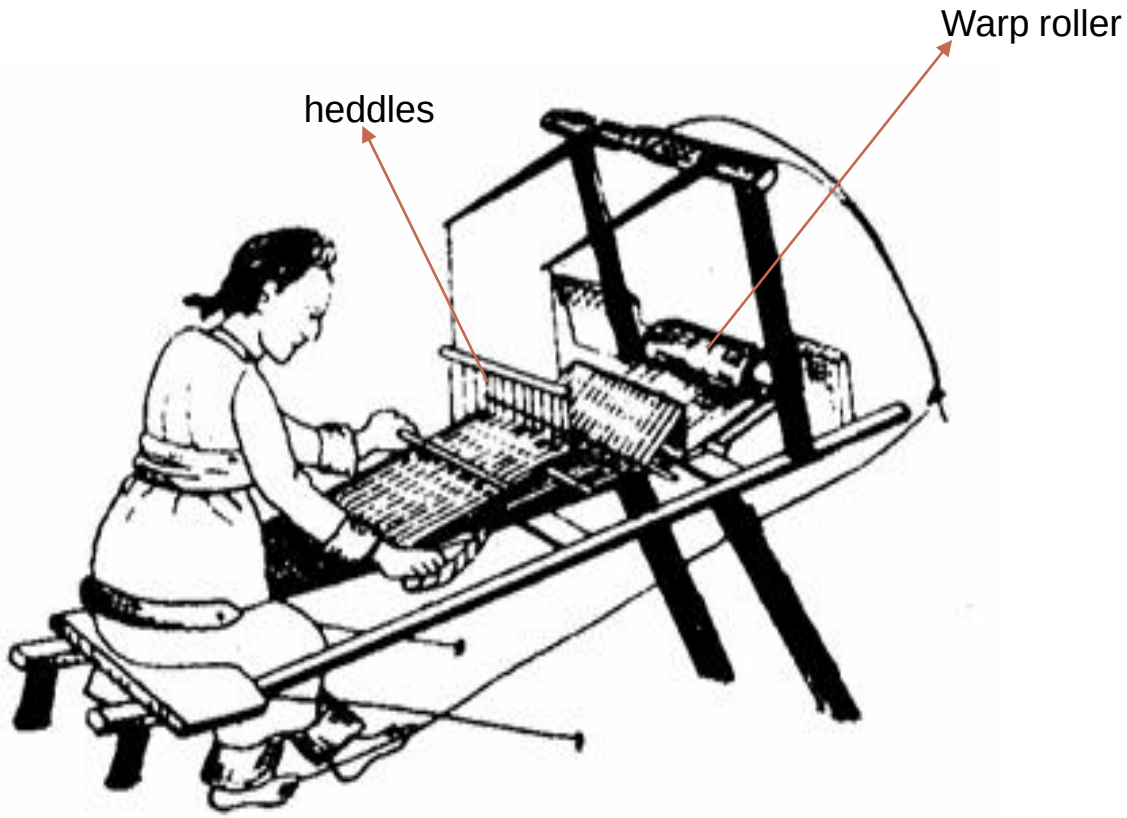
* On the Romanian territory these type of loom it was called „argea”

A SHORT HISTORY OF THE LOOM



Japanese weaver.
Second quarter of the twentieth century
Source: https://commons.wikimedia.org/wiki/File:Japaneseweaver.jpg (accessed on 30 September 2020)

A SHORT HISTORY OF THE LOOM

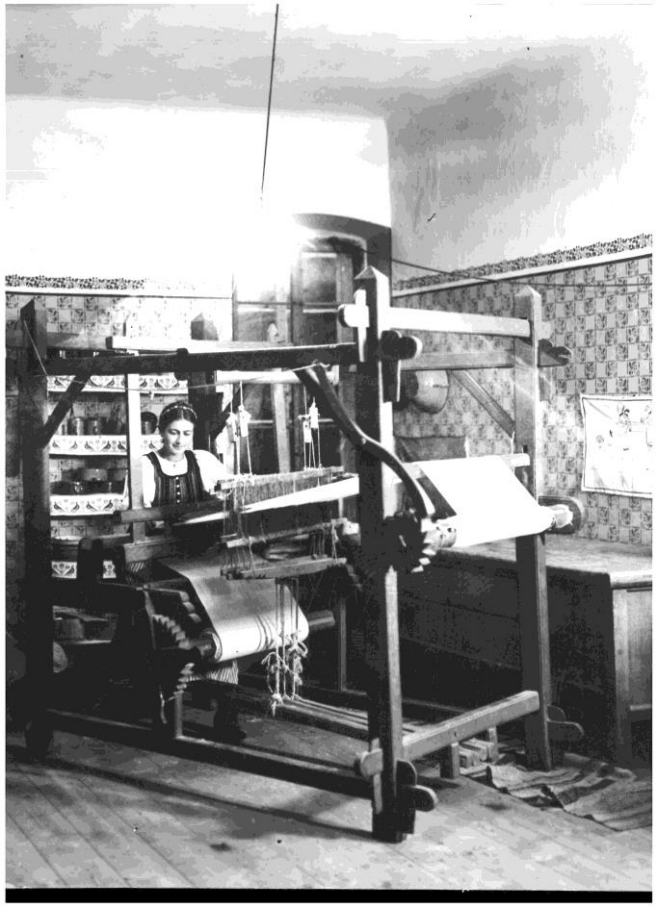


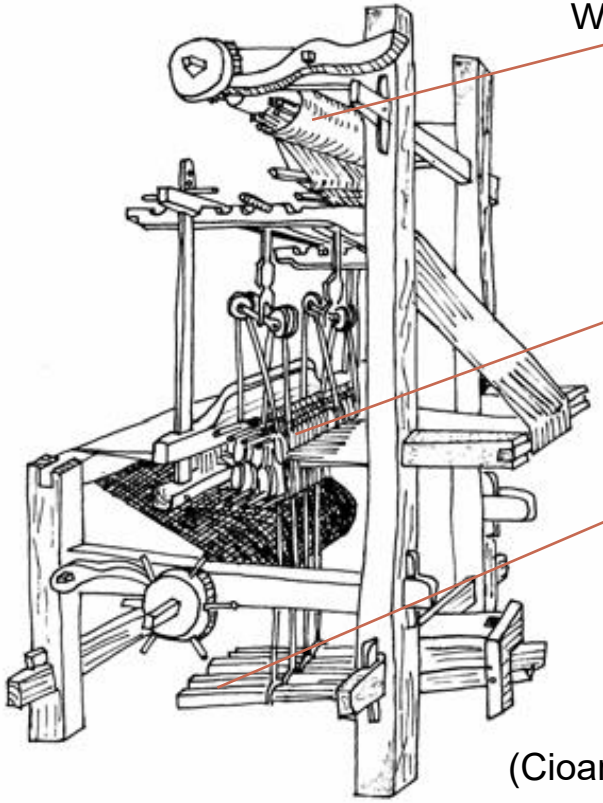
A type of manual horizontal loom with warp roller and heddles activated with the feet by the weaver (Cioară, 2008, 27)

- 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

SHORT HISTORY OF LOOMS

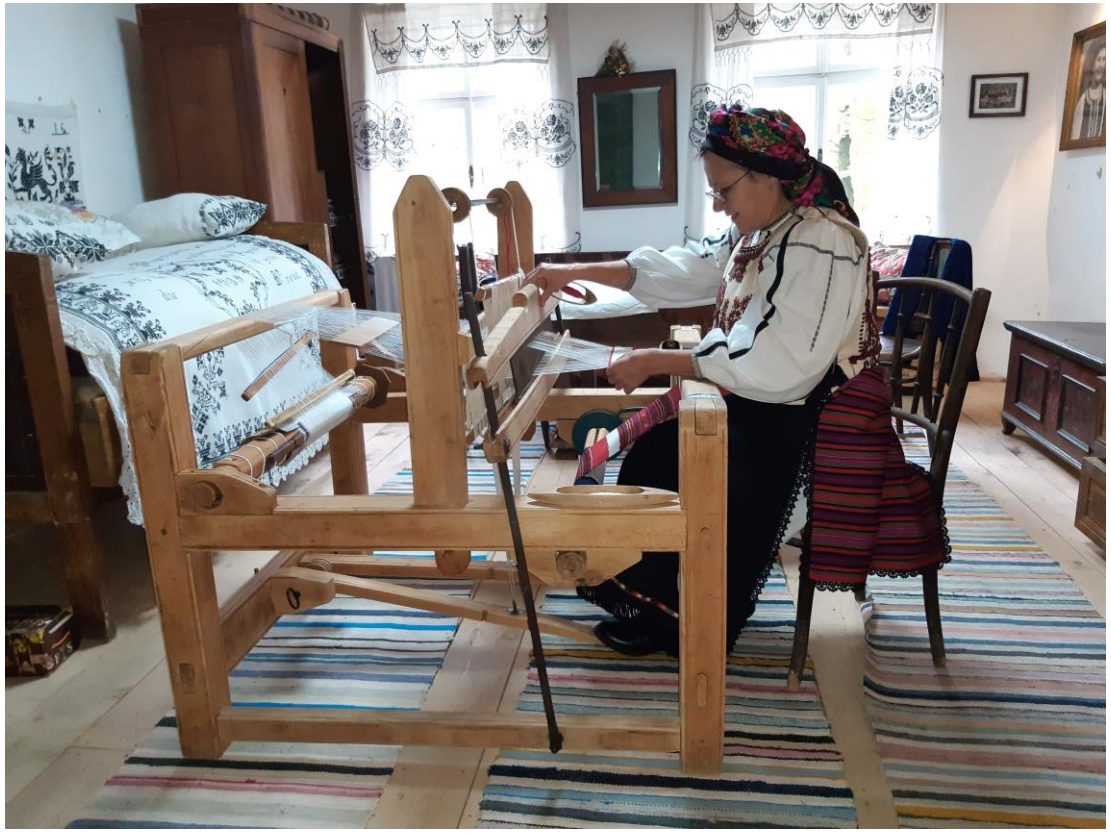




(Cioară, 2008, 28)

Types of manual horizontal looms

A SHORT HISTORY OF THE LOOM



Romanian weaver craftsmen Rodica Ispas, Sibiu county, Romania. Source: Elena Găvan, 2020.

Weaver`s workshop. Ethnographic Open – Air Museum (ETAR), Gabrovo, Republic of Bulgaria. Source: Elena Găvan, 2011.

SHORT HISTORY OF 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

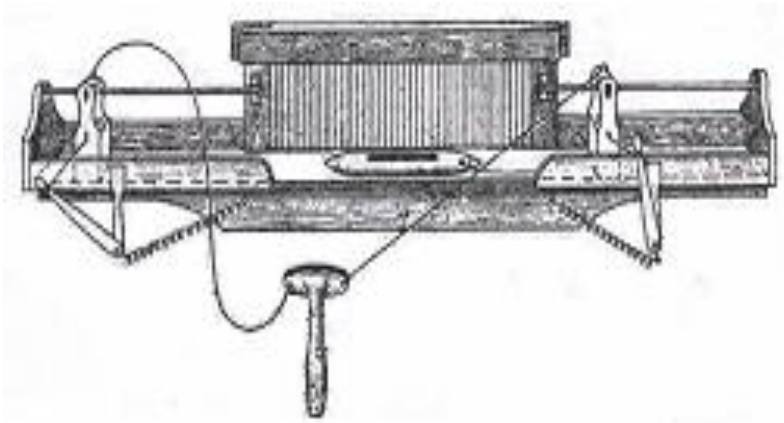
- Specialized Crafting workshops are created or are developed. During the Middle Ages those workshops transformed this craft into an art through their unique style

- 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 necesity and to the larger variety of textile products → the emergence of mass production during the 20th century

*

SHORT HISTORY OF THE LOOM



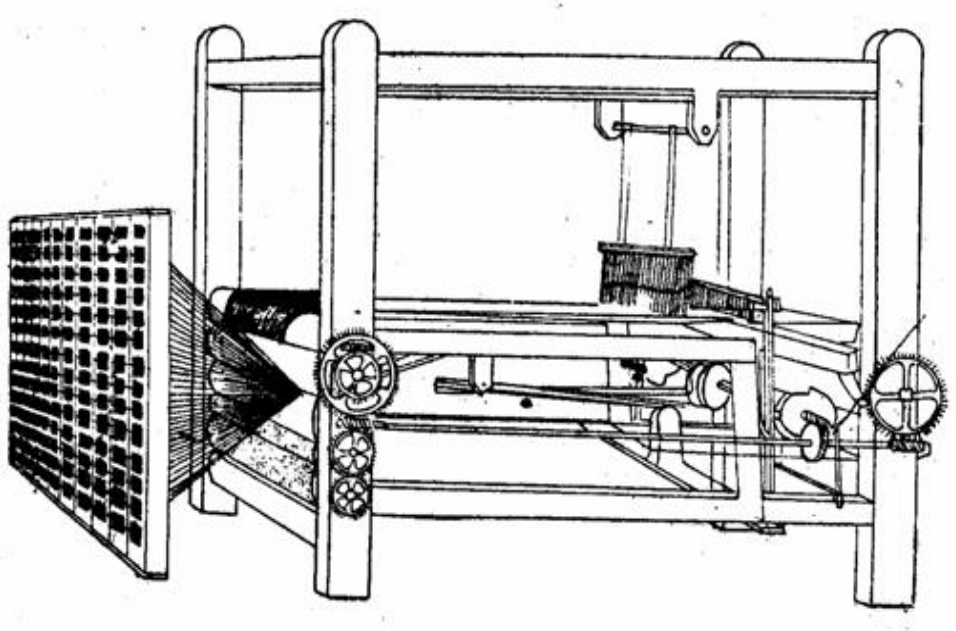
Manual device for operating the shuttle
(Cioară, 2008, 29)

Flying shuttle.
Source: https://en.wikipedia.org/wiki/Flying_shuttle
(access at 23 September 2020)

The mechanizing of the manual horizontal loom

- 1678: a naval officer published o 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

SHORT HISTORY OF THE LOOM



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

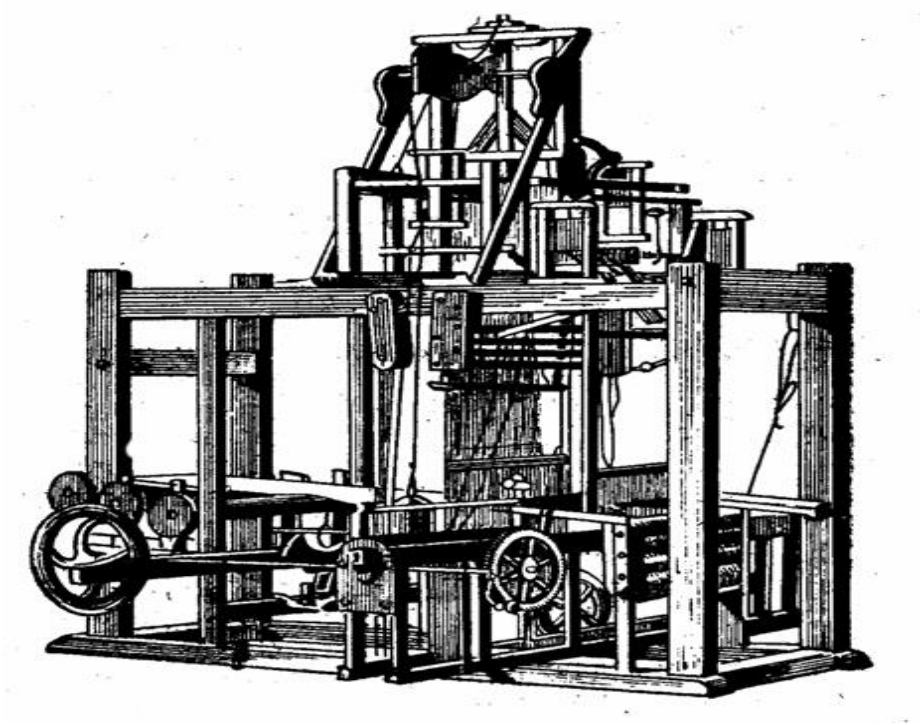
The mechanizing of the manual horizontal loom

- 1784: Edmond Cartwrigt 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

SHORT HISTORY OF 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

SHORT HISTORY OF THE LOOM

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

Detail of Jaquard loom at TextielMuseum Tilburg, Netherlands

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

SHORT HISTORY OF THE LOOM

The mechanizing of the manual horizontal loom

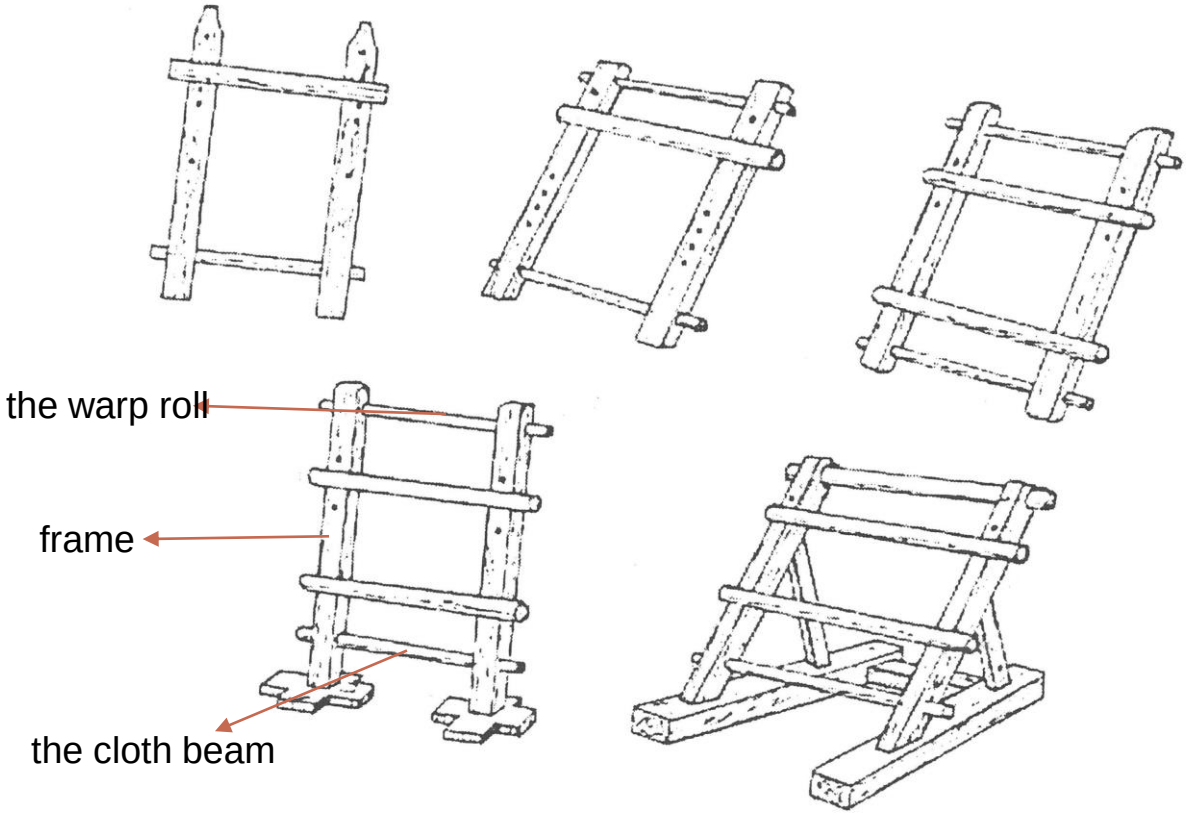
- 1920: the waved shed loom is invented; later on the multiphase machine appears
- 1922: the weaving machine where the yarn is hooked on one side by the giver (the Gabler system) is invented
- 1924: Rossmann patents the ballistic weft insertion, later used by Sulzer
- 1930: the Dewas system is patented; 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

SHORT HISTORY OF 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/

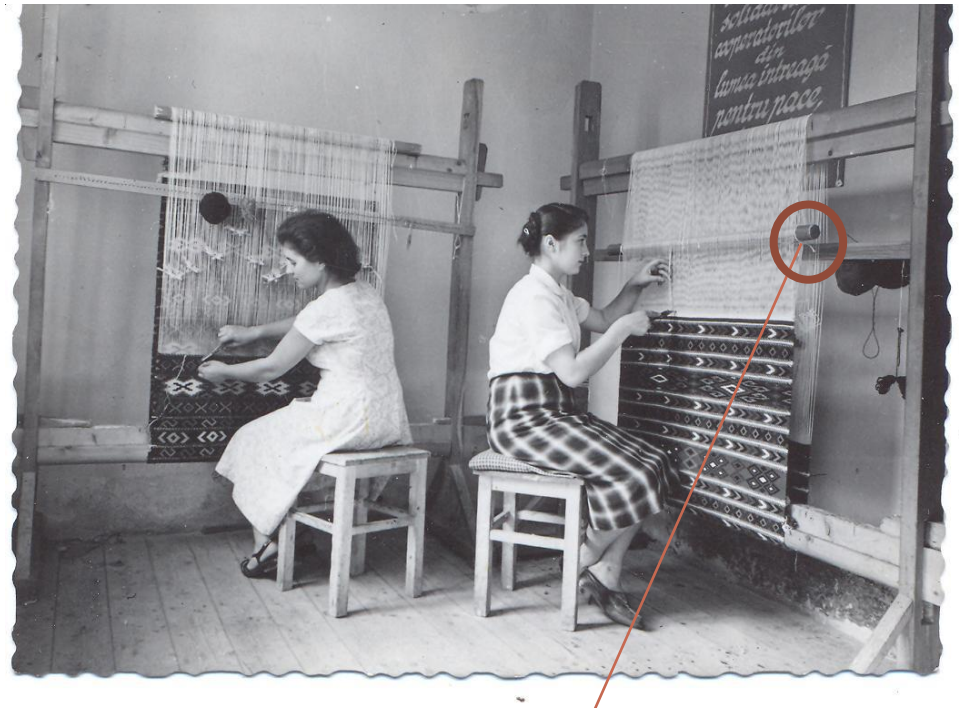
TYPES OF MANUAL LOOMS: THE VERTICAL LOOM



Types of vertical loom.
(Lungulescu, 2004, 37)

- It is characterized by a simple wooden vertical rectangular frame
- The tensing of the warp is done on both extremities: upper (the warp roll) and bottom (the cloth beam)
- The warp is tied between two bars
- The weaving is made from bottom to top
- Warping is made in a circular manner: the continuous thread follows a circular path on the two tension bars, underneath the shed the thread is passed starting towards the top bar and returns towards the bottom bar
- The shed is created around the thin bar fixed on the

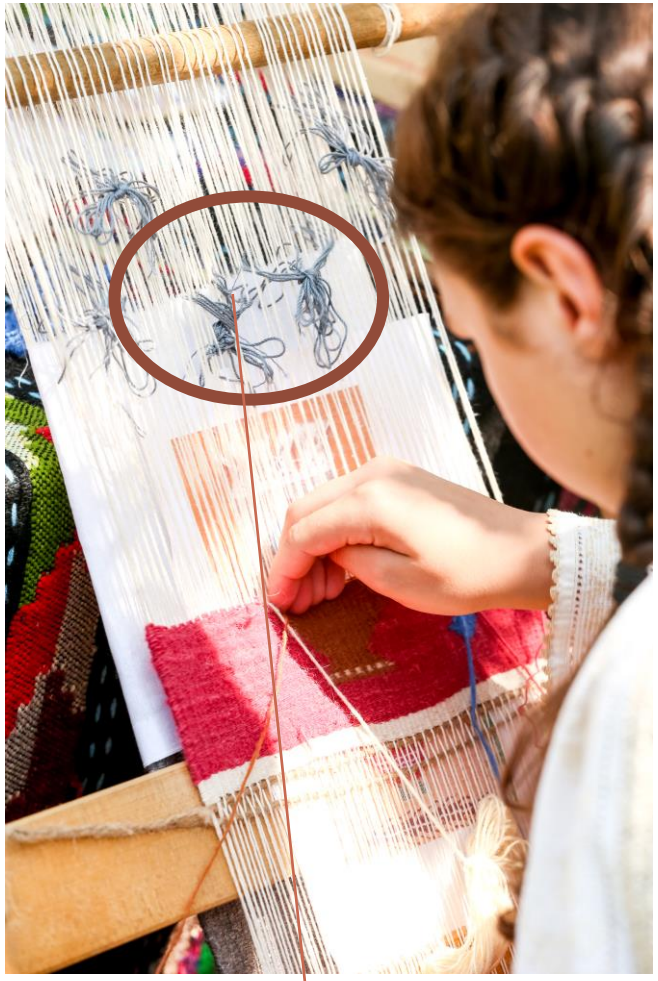
TYPES OF MANUAL LOOMS: THE VERTICAL LOOM



The **shed** is picked either with the help of a dividing stick fixed on the width

- The shed is picked either with the help of a dividing stick fixed on the width of the cloth, or by hand or with the help of a heddle made by strings placed partially or on the whole width of the cloth
- The weft thread is inserted either with the help of a small wooden bobbin on which the thread was winded or with the help of a small yarn in the shape of an eight in order to avoid it entanglement, or by hand
- The fixed width of the cloth is controlled by the length of the weft thread which is inserted equally in the shed without it being tightened excessively and by positioning the warp threads
- The weft follows the measurements and shape of the drawing, meaning it can occupy smaller or larger portions on the cloth
- At the end of the weaving process, the weft threads overlapped resulting in a simple knot-free double-faced cloth.

TYPES OF MANUAL LOOMS: THE VERTICAL LOOM



The shed is picked by a heddle made by strings

The weft thread is inserted with a small yarn

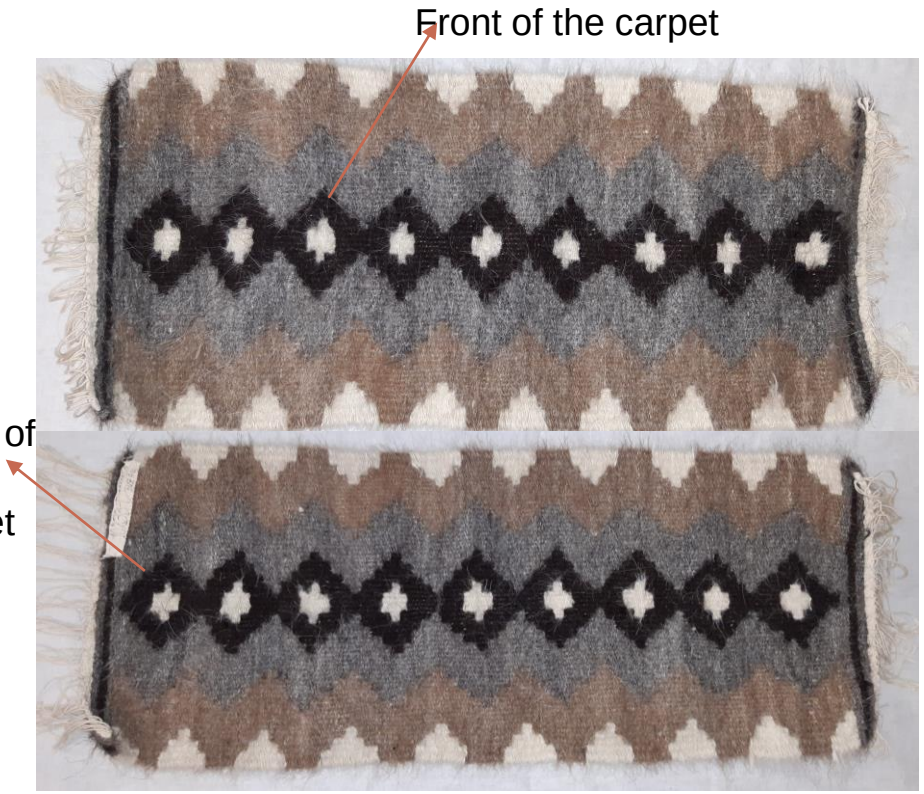
TYPES OF MANUAL LOOMS: THE VERTICAL LOOM

The weft thread are fixed with the fingers

The weft thread are fixed with the fork

The weft follows the measurements and shape of the drawing

TYPES OF MANUAL LOOMS: THE VERTICAL LOOM



Goat hair woven carpet. Buzău county, Romania. 21th century. The textilles collection of the ASTRA Museum, Sibiu, Romania.

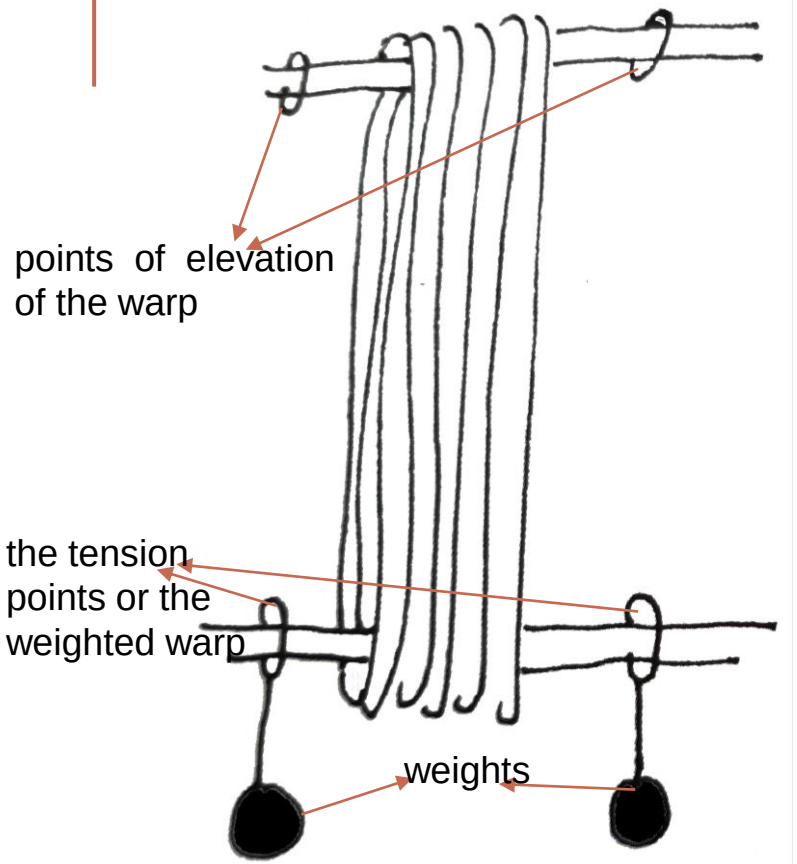
- The quality and symmetry of the edges is directly influenced by the precision used in warping the threads
- The tension of the threads is very important since it gives resistance, equal diameter and length of threads
- An equal distance of threads is important for the general aspect of the cloth
- Variable dimensions are generated by the finite product
- The cloth does not surpass the length of the loom
- Materials: wool, goat hair
- Products: carpets, tapestry, bags, napkins

THE PARTS OF A VERTICVAL LOOM

HOW TO ASEMBLE MANUALLY A VERTICAL LOOM

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

TYPES OF MANUAL LOOMS: THE *STICK* WEAVING SYSTEM

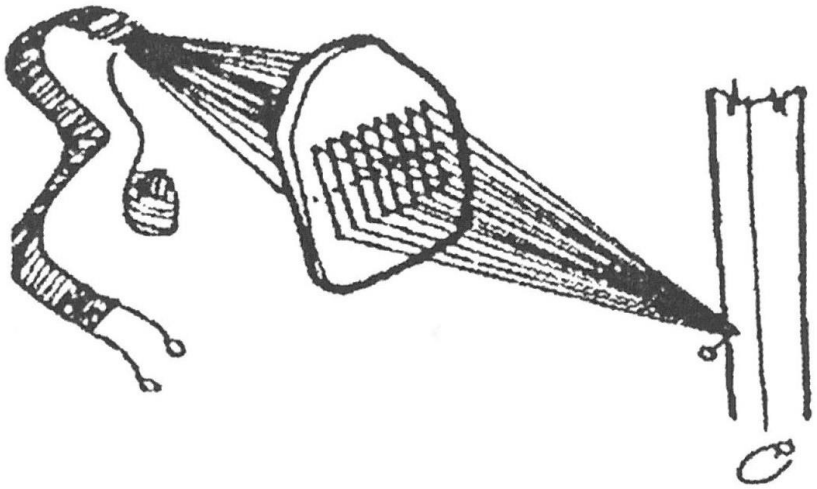


Representation of the stick circular warp weaving. (Zaharia, 2008, 62)

- The name derives from the usage of *sticks* when weaving
- Technique: only the warp threads are used; the process consists of twisting them between themselves from left to right and by inserting a stick on each row. This leads to a consolidation of the twists without using weft threads
- The warp is circular, being tied to two opposing sticks. The sticks are tied for example one to a tree and the other one is tied to the house's beam
- The tensing of the warp is done by pressing the bottom stick or with the help of weights tied to it
- The purpose of the sticks is to retain the twisting slowly pushing it towards the middle of the free threads (in the back) thus raeting the needed structure on the back of the warp
- Materials:materiale: wool, goat hair
- products: belts

(Zaharia, 2008, 62)

TYPES OF MANUAL LOOM: THE *BOARD* WEAVING SYSTEM



Representation of the board weaving system. (Lungulescu, 2004, 40)

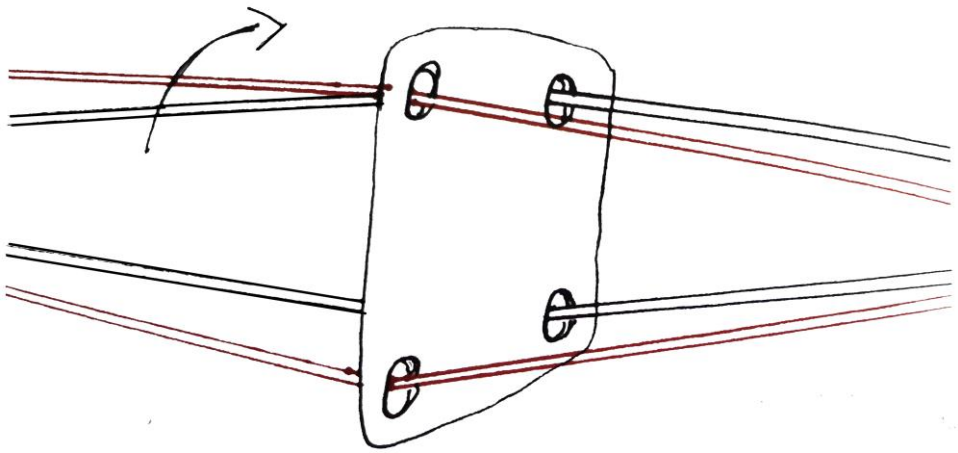
- The name derives from the usage of a board that has the same purpose as the heddles in choosing the shed
- In the middle the board has free vertical lines in the form of teeth that have a small hole in the center
- The weaving is done one at a time through the spaces of the teeth and through the holes
- The shed is made by the vertical handling of the board
- Technique: the warp threads are passed through the board, which is placed horizontally and it is tensed in two points
- Fixed points: the first one is the weaver's waist and is correspondent with the direction of the beating of the weft; the second opposing point consists of a wooden bar which holds the warp in the shape of an eight in order top prevent its entanglement
- Materials: wool, goat hair
- Products: belts

(Zaharia, 2008, 63)

TYPES OF MANUAL LOOM: THE *BOARD* WEAVING SYSTEM

The wood collection of the ASTRA Museum, Sibiu, Romania.

TYPES OF MANUAL LOOMS: *TABLET* WEAVING

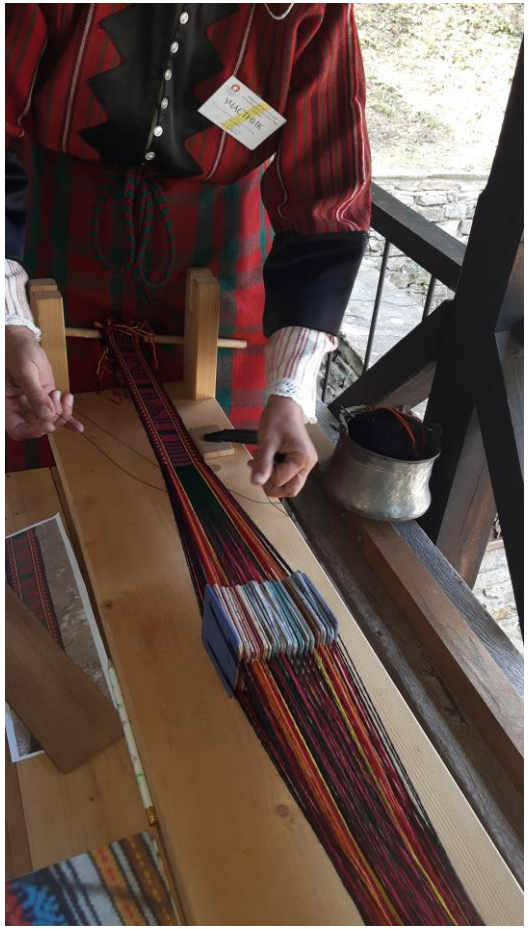


Representation of tablet weaving.
(Zaharia, 2008, 64)

- 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 incorporeted 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

TYPES OF MANUAL LOOMS





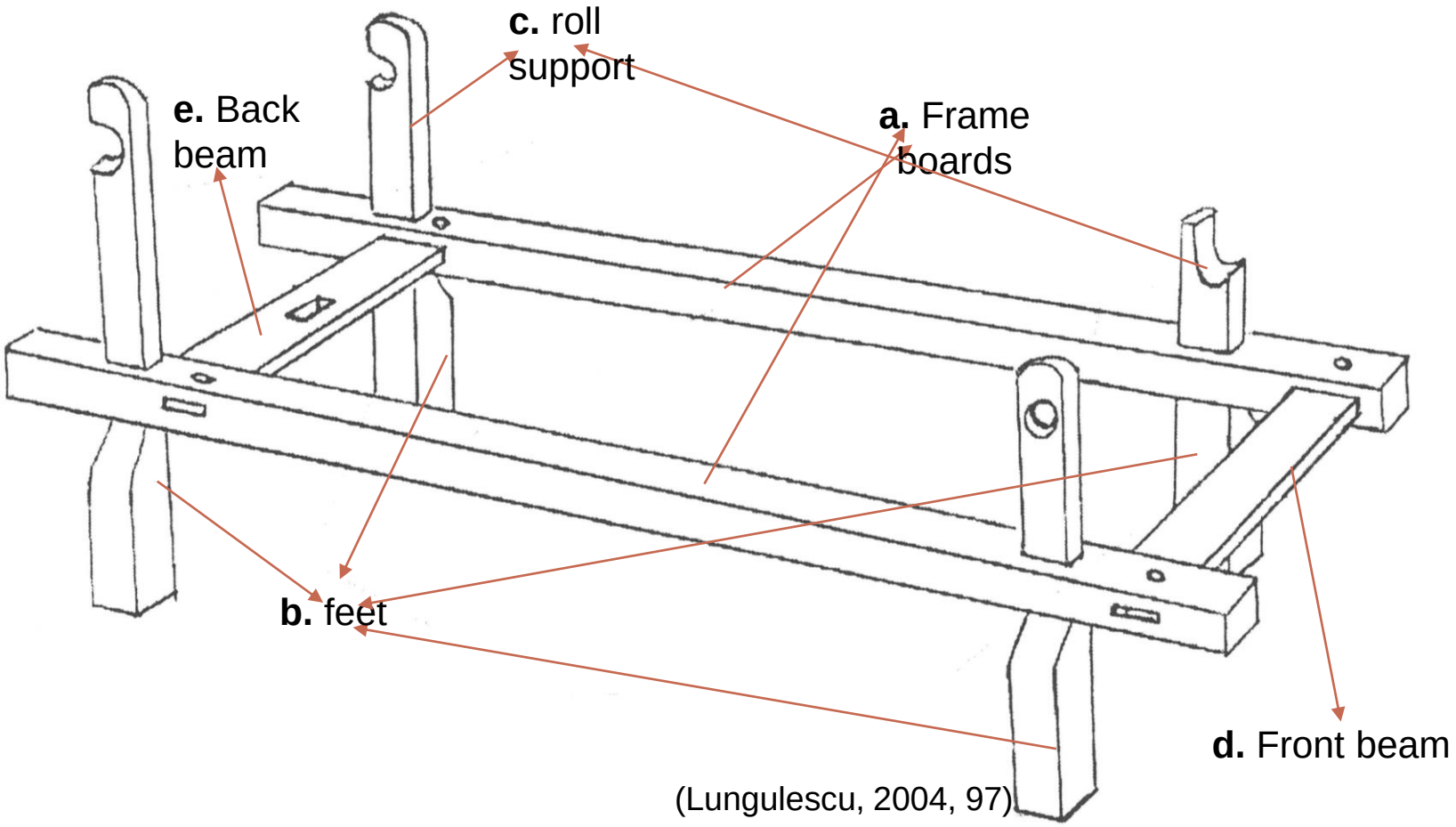

Tablet weaving. Mariana Dimitrova, craftswoman from Plovdiv, Bulgaria, 2016.

TYPES OF MANUAL LOOMS: 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
- The loom is made by: a man in the family or by carpenters

THE PARTS OF THE HORIZONTAL LOOM

THE FRAME

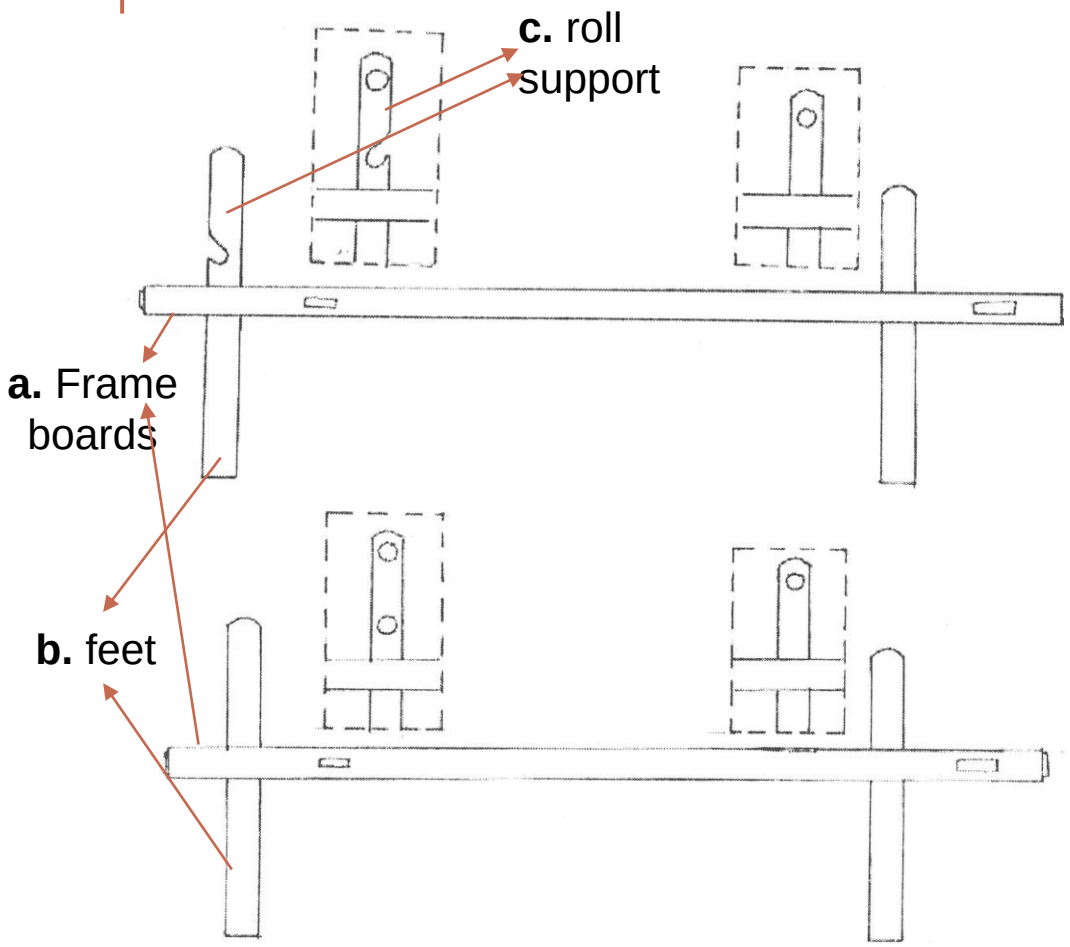


(Lungulescu, 2004, 97)

The frame is made of:
a. Frame boards
b. feet
c. Roll support
d. Front beam
e. Back beam

THE PARTS OF THE HORIZONTAL LOOM

THE FRAME

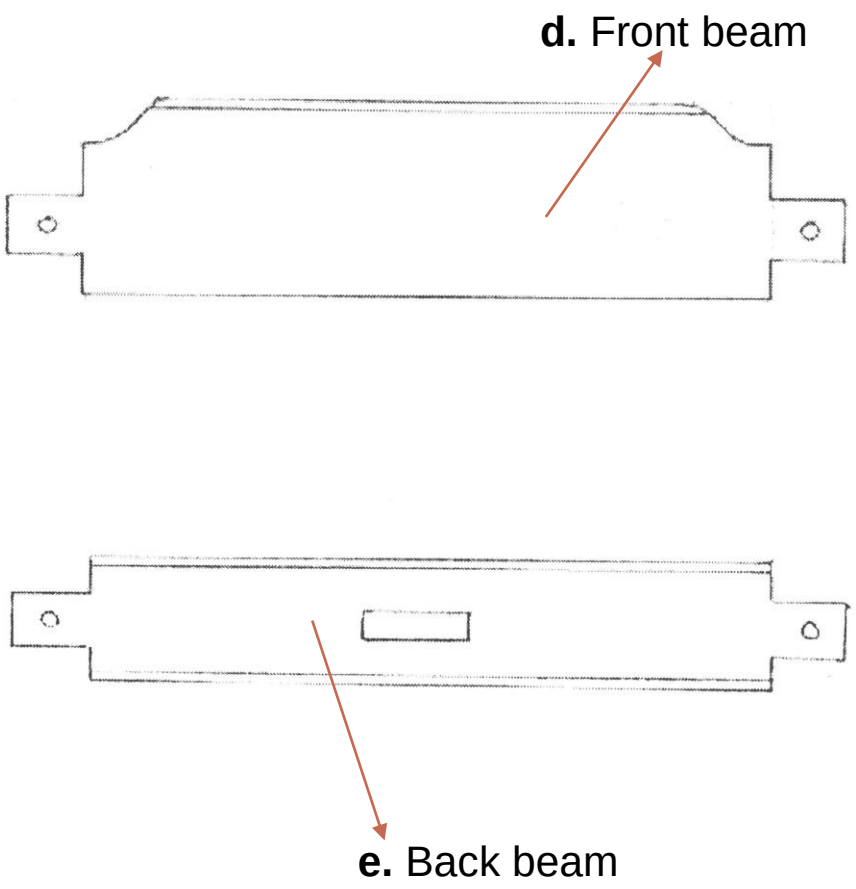


- the frame boards (a) are placed on top of the feet (b) with the help of wooden nails;
- The roll support (c) is part of the feet; these boards are narrower and shorter than the support and have small dents in which the rolls are placed (their size varies according to the loom)
- The frame boards (a) are horizontally connected by two wooden boards placed one in front (d) and one in the back (e);
- In the back, the roll support (c) has circular holes in which the roll ends are placed
- The two back roll supports are longer than the front ones because two rolls are placed on it (one on top and one underneath it)

(Lungulescu, 2004, 97)

THE PARTS OF THE HORIZONTAL LOOM

THE FRAME

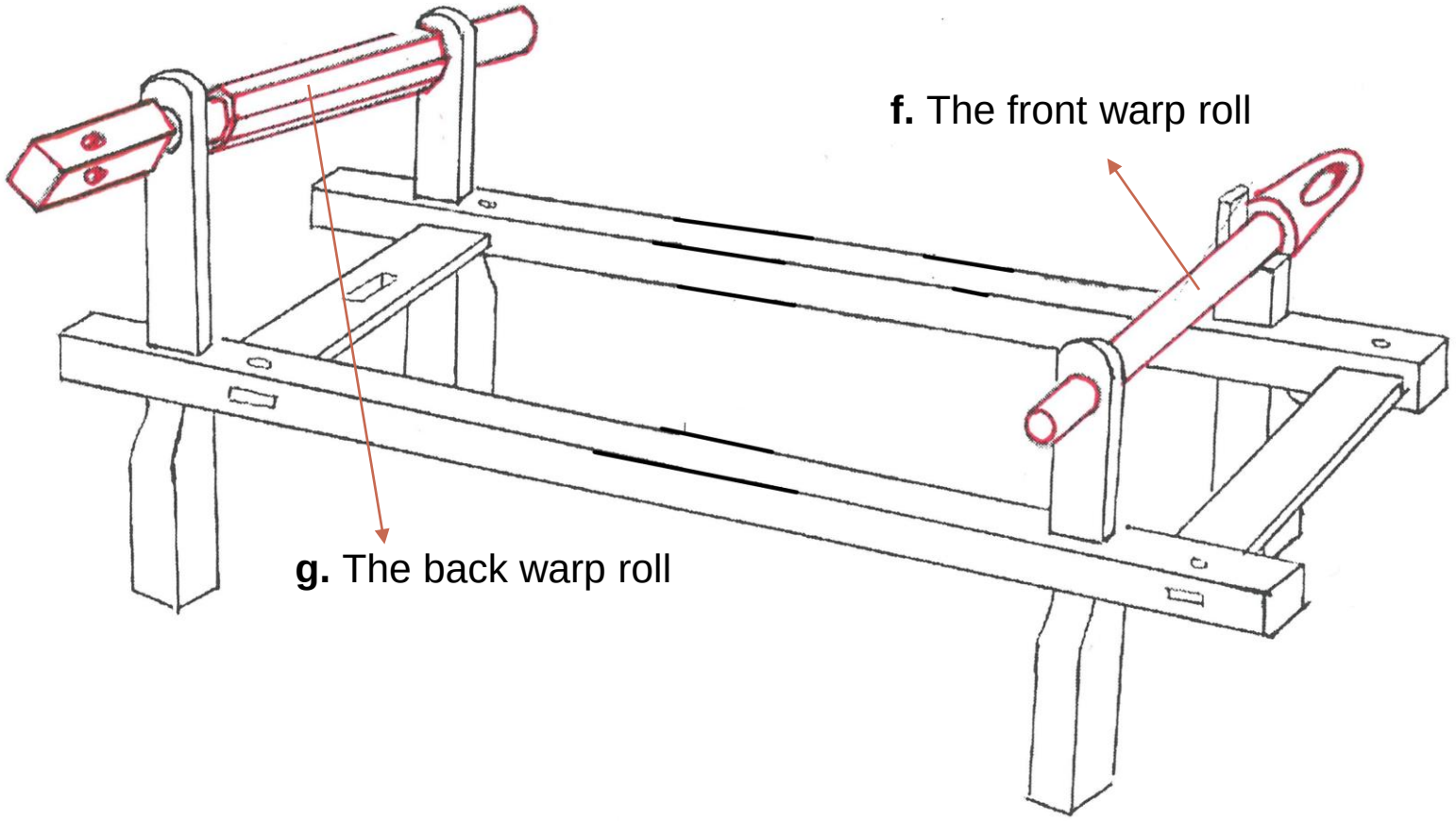


- The boards tie the sides in order to form the frame
- The first board (d): is placed in the front, after the roll support (front) being used as a chair by the weaver
- The second board (e): is placed in front of the back roll support; in its middle there is a rectangular hole in which the treadle frame is inserted; it is narrower than the first one
- Both boards have narrower ends which are inserted in the sides of the loom; these are secured with dowels at the ends (which can be removed when the loom is taken apart)

(Lungulescu, 2004, 99)

THE PARTS OF THE HORIZONTAL LOOM

THE ROLLS OF THE LOOM



f. The front warp roll

g. The back warp roll

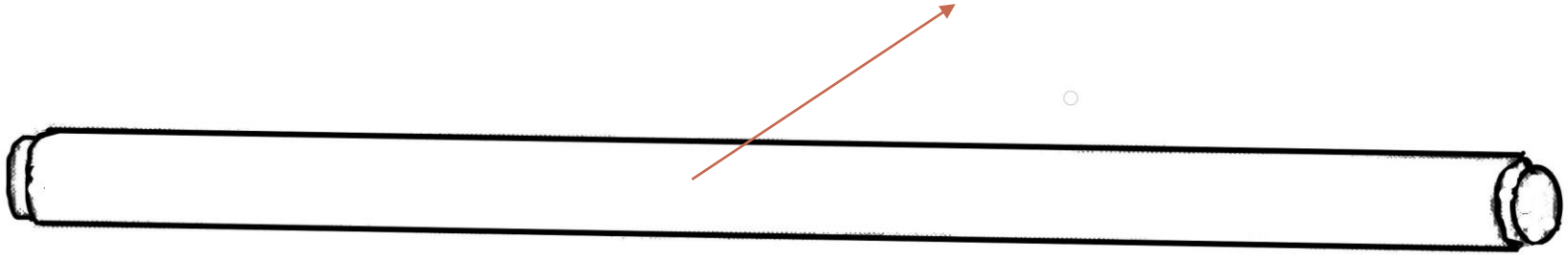
- Specially carved holes are present on certain types of looms, due to this reason the ends of the rolls are narrower

(Lungulescu, 2004, 29)

THE PARTS OF THE HORIZONTAL LOOM

THE ROLLS OF THE LOOM

f. The front warp roll

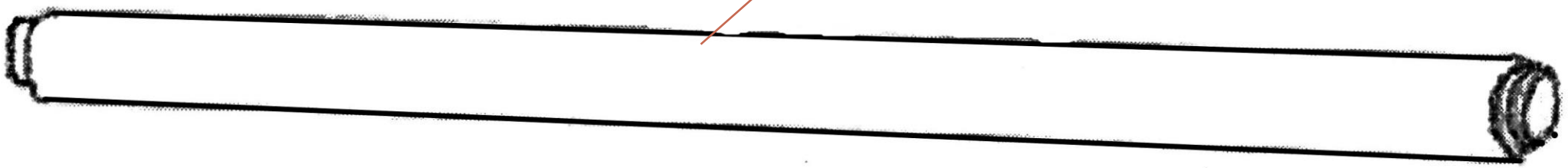


- The front roll or the wrapping roll is placed/ inserted in the holes of the roll support
- on this roll the woven cloth is wrapped
- It is round

THE PARTS OF THE HORIZONTAL LOOM

THE ROLLS OF THE LOOM

g. The back warp roll



- The back roll or the unwrapping roll is placed on the back roll support (there are looms in which this is placed on the sides)
- On it the warp threads are unwrapped
- It has the shape of a prism cross-section, with many faces

THE PARTS OF THE HORIZONTAL LOOM

THE ROLLS OF THE LOOM

The number of rolls can vary between two and four rolls*:

- The first roll is placed in the front. The cloth is wrapped on it.
- The second roll is placed in the front on the roll support. Its ends are narrower having the same diameter as that of the holes of support. Its purpose is to maintain the tension of the cloth.
- The third roll is placed in the back of the loom. The warp threads are wrapped on it and will be unwrapped during the weaving.
- The fourth roll is placed in the back on the upper side of the roll support in two holes. Its ends are narrower in order to be inserted in the holes of the roll support. Its purpose is to extend the tension of the warp.

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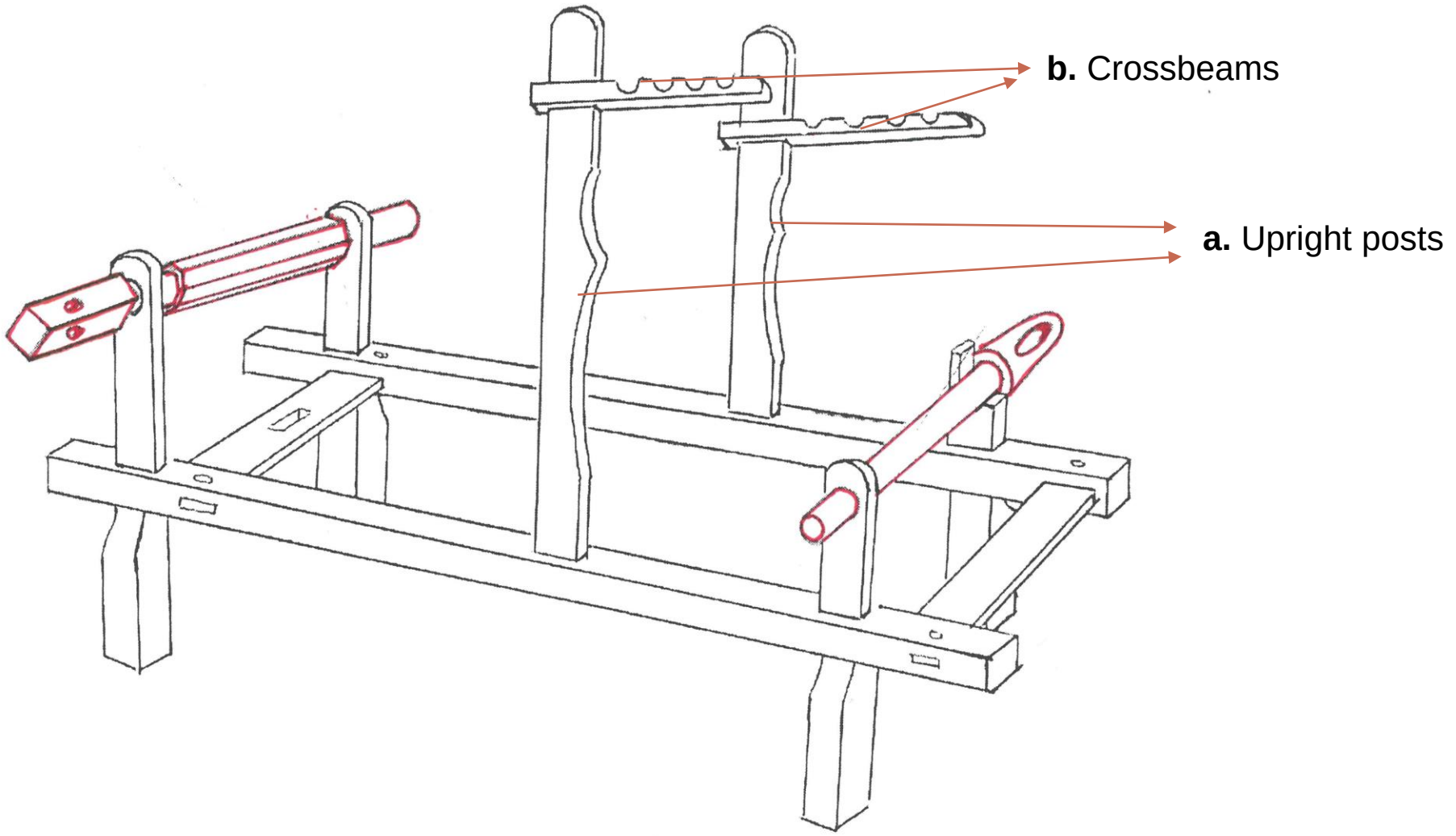
Four-roll loom from Rupea, Brașov county, Romania. Restored by Gabriela Lungulescu in 2004. The ASTRA Museum`collections, Sibiu, Romania

* Hence the name two-roll loom or four-roll loom.

THE PARTS OF THE VERTICAL LOOM

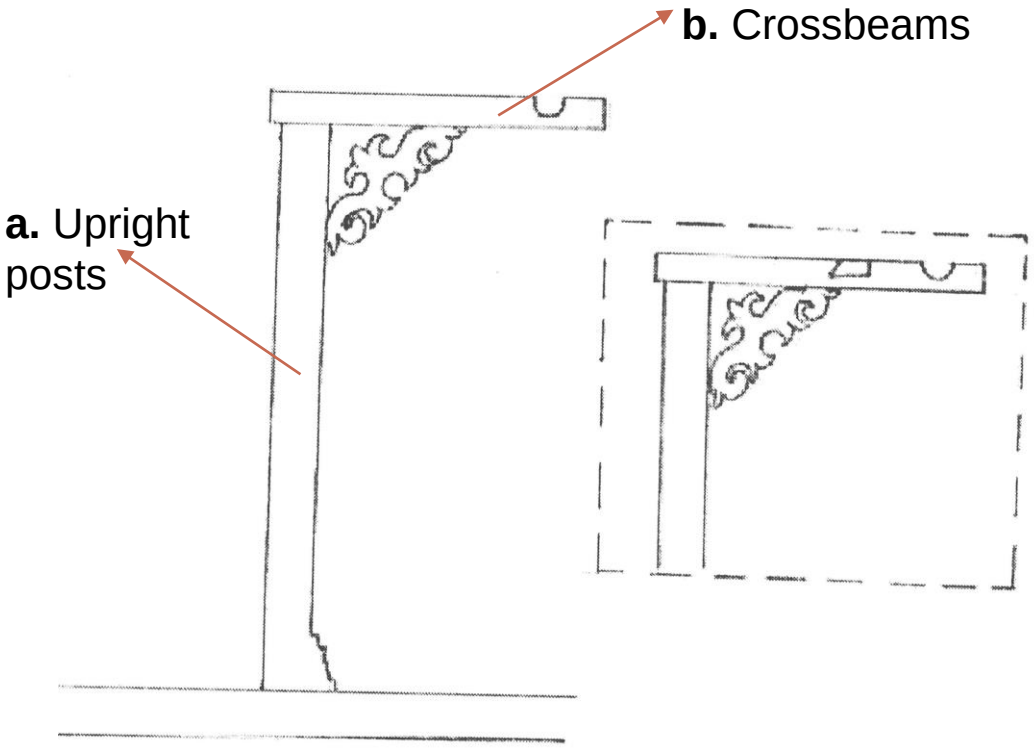
THE ELEVATED PART OF THE LOOM



a. Upright posts
b. Crossbeams

THE PARTS OF THE HORIZONTAL LOOM

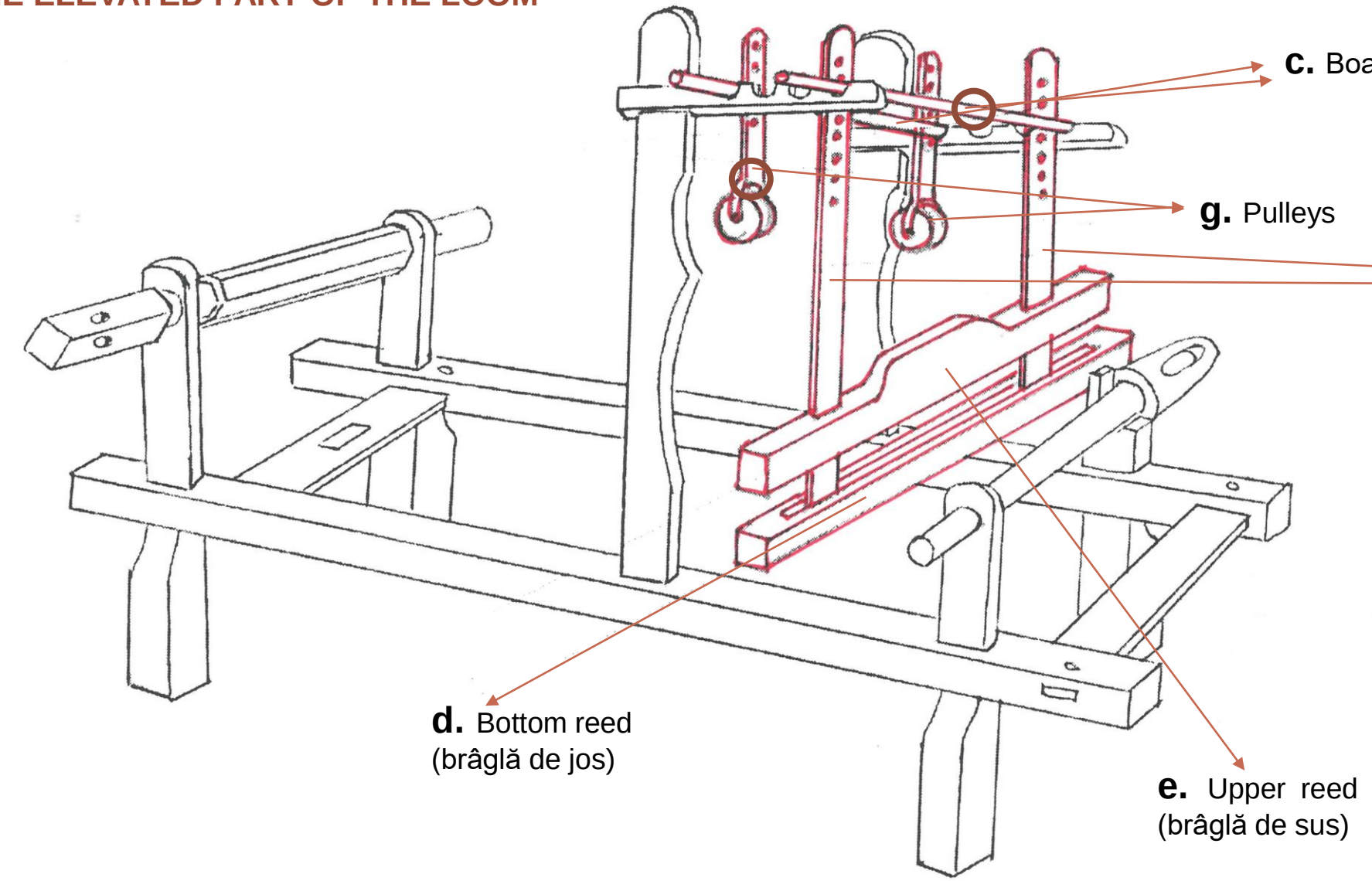
THE ELEVATED PART OF THE LOOM



- The upright posts of the loom (a) are attached one on each side, on the frame of the loom
- the crossbeams (carafte) are placed in the upper part of the upright posts (b), two wooden bars attached with wooden nails
- The crossbeams (carafte) present several dents: one on the bottom part of each bar, a trapeze carving of the wood in which the ends of the bar that supports the pulleys are attached, the second carving is as wide as the crossbeam and supports the reed frame
- The crossbars are united by two boards. These boards are called „parânge”

THE PARTS OF THE HORIZONTAL LOOM

THE ELEVAYED PART OF THE LOOM



c. Boards/părânge
d. Bottom reed support/brâglă
e. Upper reed support /brâglă
f. Upright posts
g. Pulleys

THE PARTS OF THE HORIZONTAL LOOM

THE ELEVATED PART OF THE LOOM

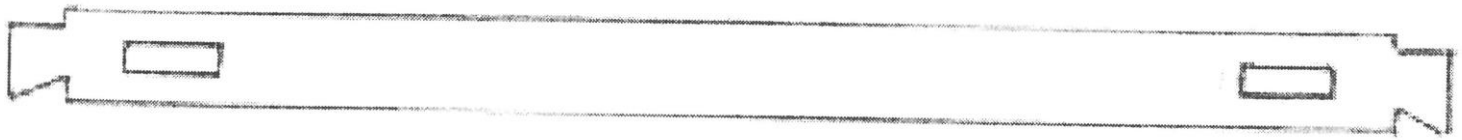



Different types of the boards

- The boards/ părângele (c) are usually two wooden panels placed horizontally: one supports the reed support and the second one the pulleys or if they are missing, it supports the heddles
- shape: two round panels or slaps that have their ends sharpened or carved in the same shape as the dents of the boards

THE PARTS OF THE HORIZONTAL LOOM

THE ELEVATED PART OF THE LOOM

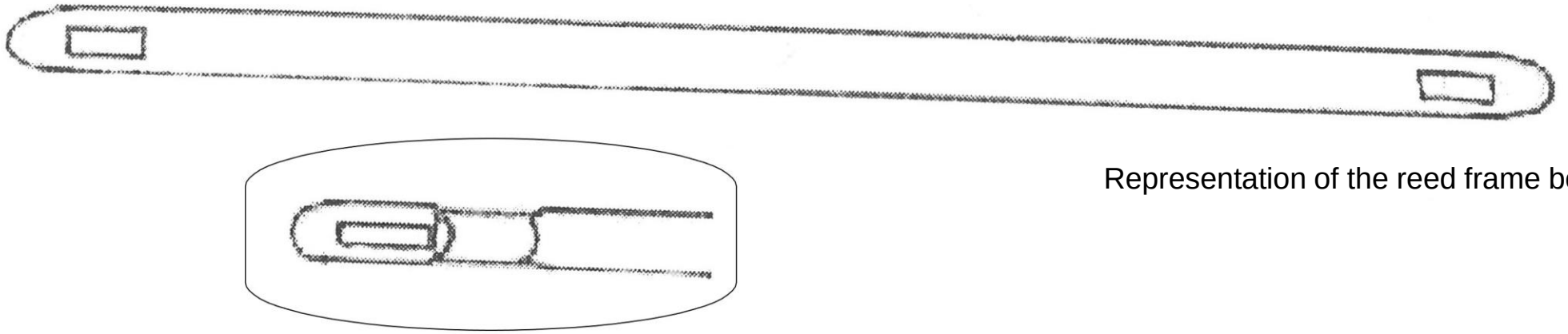


Representation of the pulleys board

- The board that supports the pulleys is fixed on the crossbeam in the two specially carved holes which do not surpass the thickness of the crossbeams and are similar in shape with those
- Two rectangular carvings can be seen on its surface, in which two wooden posts are inserted; they support the pulleys' bottom end.

THE PARTS OF THE HORIZONTAL LOOM

THE ELEVATED PART OF THE LOOM



Representation of the reed frame board

- The board that supports the reed frame is longer than the one for the pulleys. It surpasses the length of the bars.
- It is tied to the bars through the semispherical dents
- At the ends it has two holes through which the ends of the reed frame are inserted

THE PARTS OF THE HORIZONTAL LOOM

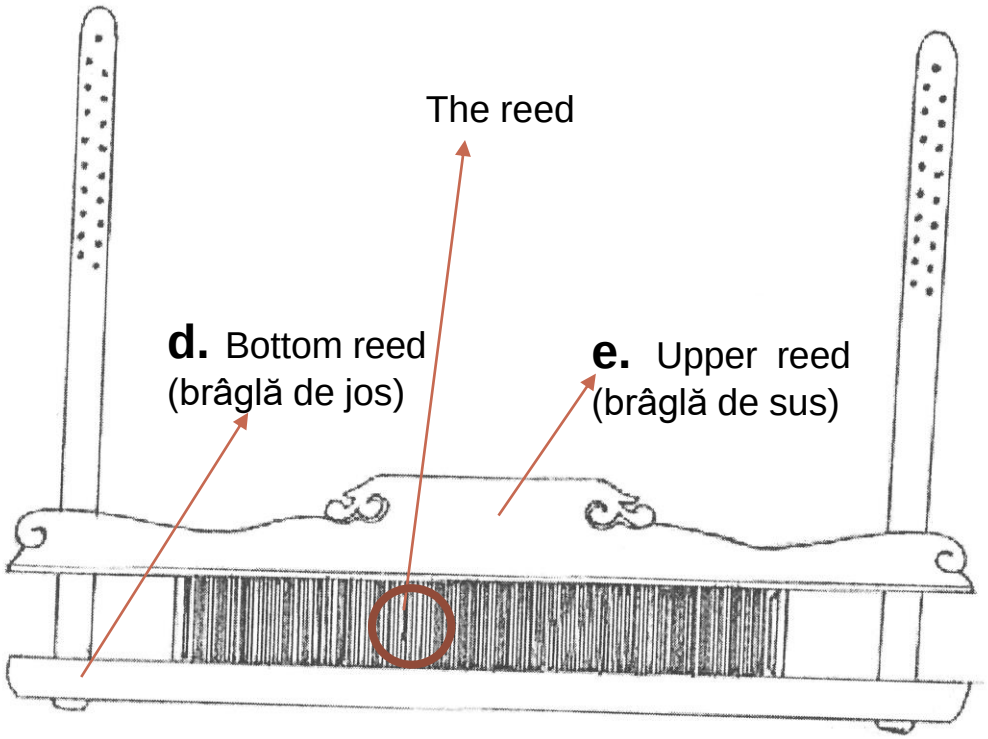
THE ELEVATED PART OF THE LOOM

f. Upright posts

- There are two posts; the connection with the boards is done with the help of ropes, at different lengths or with the help of wooden or metal nails
- Characteristics: rectangular in shape, narrow, long, thin, round in the upper part and thicker in the inferior part in order to support the lower board
- The posts have some small holes through which the wooden nails or the rope is inserted

THE PARTS OF THE HORIZONTAL LOOM

THE ELEVATED PART OF THE LOOM

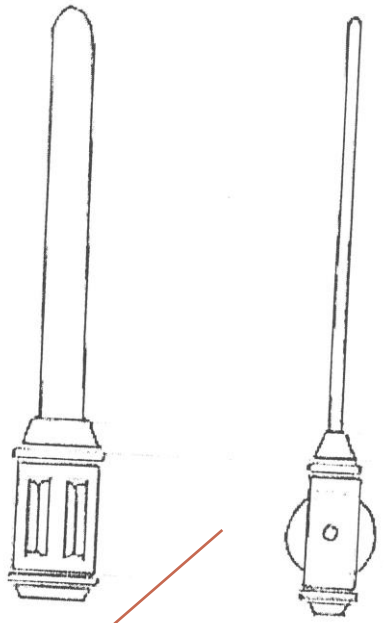


- The bottom and upper reed („brâgla”) are placed between the upright posts and the front roller
- Purpose: supporting the reed
- Consists of: two wooden planks that have a narrow long groove carved in which the reed is placed. It has two holes each at the ends that hold the ends of the posts
- The upper reed support has a bottom groove. The middle is wider and has different shapes in order to be easier to be handled during the weaving; it has a decorative purpose as well
- The bottom bar, the bottom reed support, has a rectangular shape and the groove is placed in the upper side

THE PARTS OF THE HORIZONTAL LOOM

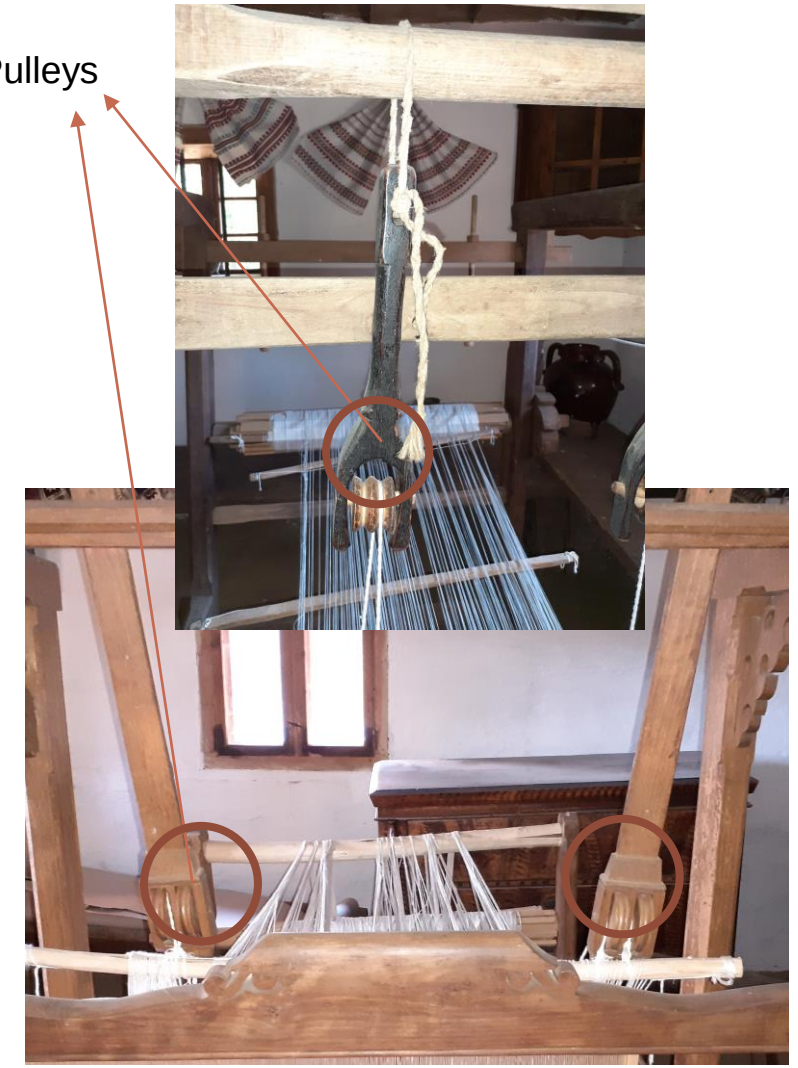
THE ELEVATED PART OF THE LOOM

- The pulleys are made of posts, wheels and holes that support the wheels (one or more)
- purpose: to change the heddles once the treadles are pressed
- Made of wood and have some grooves at the end in order to help the turning of the wheel
- The wheels have a groove for the heddle threads as well
- The pulleys are placed on the second, interior, bar
- They support the heddles



Representation of the pulleys

g. Pulleys



THE PARTS OF A HORIZONTAL LOOM

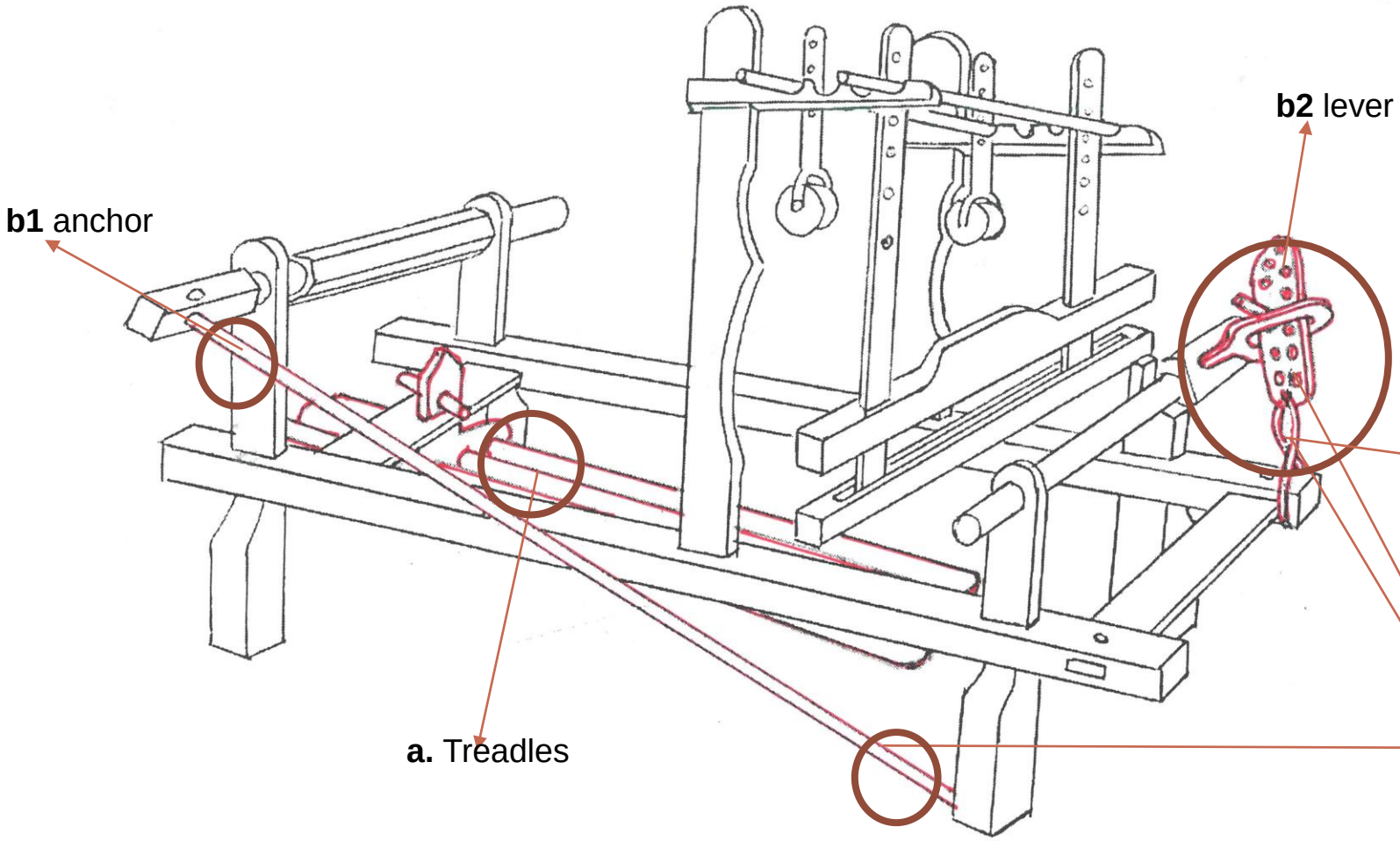
THE ELEVATED PART OF THE LOOM

- Some looms do not have pulleys, they have been replaced by two small wheels that were acted by a spindle

Romanian craftsmen Maria Tărâță`s loom, Racovița, Sibiu county. The loom was made by her husband in the 1950s.

THE PARTS OF THE HORIZONTAL LOOM

THE TRADLES AND THE STOPPING SYSTEM OF THE ROLLERS

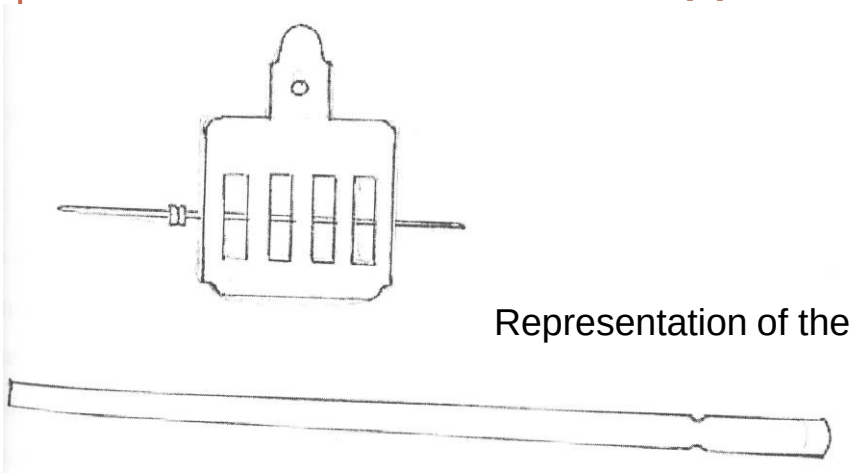


a. Treadles

b. Rollers stopping systems (**b1** anchor; **b2** lever; **b3** muierușcă)

THE PARTS OF THE HORIZONTAL LOOM

THE TREADLES OF THE LOOM (a)



Representation of the treadles system

- The treadles are made of wood
- Their number varies between two and four
- They are attached to the back bar
- Types of treadles: simple like some wooden blades (one end on the ground); those that have the upper end tied to the heddles and the other one to a bar at the bottom of the loom; the treadles are placed in specially designed places on the loom's back bar
- The treadles together with the heddles are directly involved in creating the shed

THE PARTS OF THE HORIZONTAL LOOM

ROLLERS STOPPING SYSTEM (b)

- The weaving process is done by horizontally moving the warp and of the resulting cloth in order to create the appropriate conditions for the cloth elements. This is possible by producing a certain tension directly tied to the particularities of the threads used.

- The designated tension must assure:
  - ✓ The controlled moving of the warp and cloth during the weaving process
  - ✓ The correct separation of warp threads when the shed is formed
  - ✓ The ideal conditions for weft insertion

- The horizontal moving of the warp and of the resulting cloth, as well as the system is obtained by operating the warp system (releasing the back roll) and by operating the cloth roller situated in the front of the loom

THE PARTS OF THE HORIZONTAL LOOM

ROLLERS STOPPING SYSTEM (b)

Warp controllers* are the mechanisms that directly act upon the warp or the warp roller and provide the necessary warp quantity for the weaving. It implies the pulling and gathering of the cloth as it is weaved.

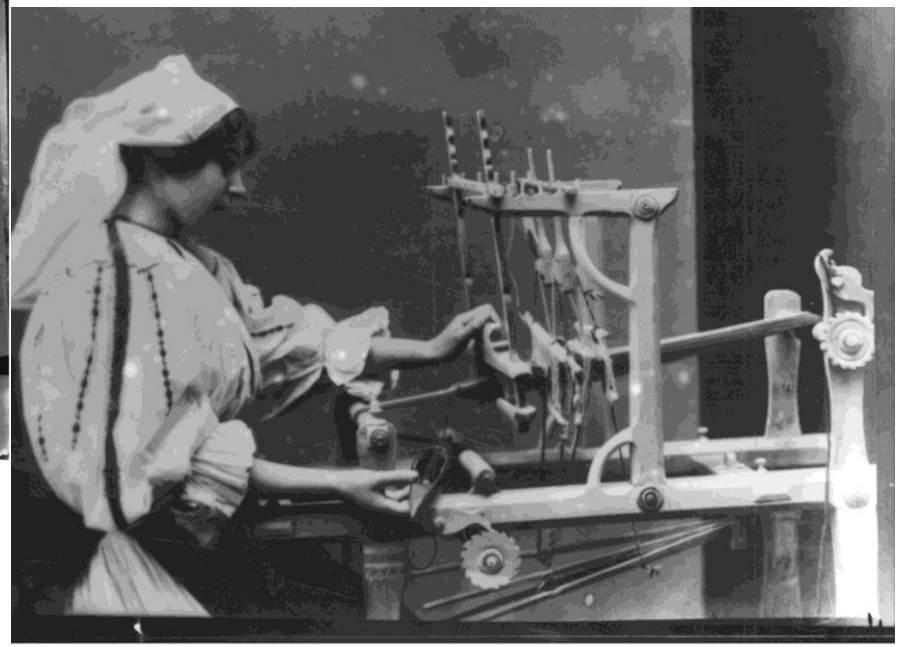
- Are attached either on one or on both sides of the back beam
- Prevent the rolling of the back roll and determine the tension of the warp threads
- Types of warp controllers: long sticks, cogwheels, ropes, chains all manually operated by the weaver when necessary
- The operating of the back roll in order to provide the necessary warp is done by a second system, that of pulling the cloth
- The pulling of the cloth from the front of the loom holds an important place in the weaving process: that of neatly gathering the cloth and that of adjusting the density of the weft threads.
- The pulling of the cloth is done with the help of a small blade/ a shovel, a cogwheel.

* Term used in the textile industry, which we will use when referring to the rollers stopping system

THE PARTS OF THE HORIZONTAL LOOM

ROLLERS STOPPING SYSTEM

TYPES OF CLASSICAL HORIZONTAL LOOMS



ASTRA Museum`collections

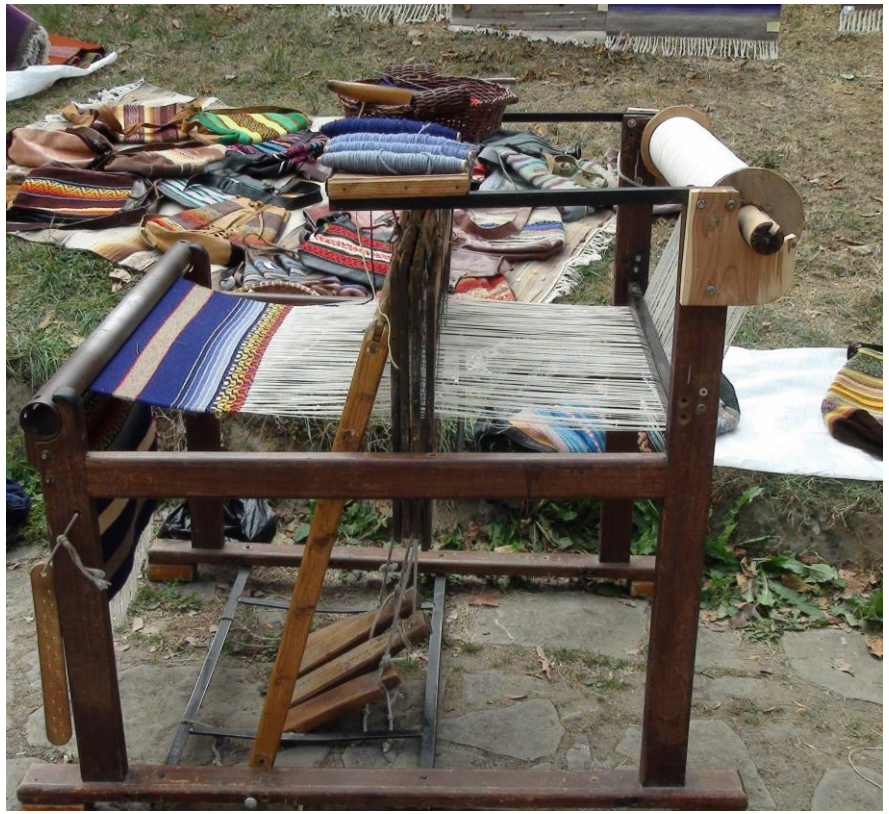
TYPES OF CLASSICAL HORIZONTAL LOOMS

Open air museum Copenhagen (Elena Găvan photo, 2013)

https://en.wikipedia.org/wiki/Loom#/media/File:Stelles_Sluti%C5%A1%C4%B7u_vectic%C4%ABbnieku_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

TYPES OF CLASSICAL HORIZONTAL LOOMS



ETAR, Bulgaria, 2013 (Elena Găvan photo)

ASTRA Museum`collections. 1997

ASTRA Museum`collections. 2011

THE PARTS OF THE HORIZONTAL LOOM

HOW TO ASSEMBLE MANUALLY A HORIZONTAL LOOM

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

TOOLS/ OTHER ELEMENTS USED IN WEAVING

STICK

- It is considered to be one of the first elements of the loom to have been mechanized; it is used since prehistory
- purpose: creating the shed by inserting it between even and odd warp threads
- It can be fixed or movable
- shape: flat, smooth
- Types of sticks:
  - ✓ shed stick (placed between the warp threads);
  - ✓Heddle rod* (placed outside the warp threads);
  - ✓Leash rod (wider and it surpasses the length of the warp)

*Part of the heddles through which the warp threads are inserted; the board on which the heddles are made

TOOLS/ OTHER ELEMENTS USED IN WEAVING

THE HEDDLE

- Are made by women out of durable thread, usually cotton, through a complicated process of knots on a wood reed or on rods
- Their length varies according to the desired cloth
- It is a multitude of eyes centrally placed; the eyes are the result of the loop tying of two threads one placed in the upper part and one place in the bottom part, equal in number, shape, size and tying with the first one.
- Through each eye the warp is threaded, according to a certain rule and in accordance with the structure of the desired cloth
- purpose: lifting and descending different warp threads in order to form the shed, the space through which the shuttle that holds the warp is passed

How we can made our own heddles!
Documentary movie made with craftsman Rodica Ispas, Avrig, Sibiu county, Romania.

TOOLS/ OTHER ELEMENTS USED IN WEAVING

THE LITTLE HEDDLE/ *IȚIȘOARE*

- The little henddle are related with the heddle but smaller
- They are used to make patterns design
- Are fixed behind the heddles and are raised one by one, each forming its own shed (when you raised all you have finished the design)

TOOLS/ OTHER ELEMENTS USED IN WEAVING

THE SHED

- It is created by listing half of the heddles and dropping the other half through which the weft threads are inserted
- The shed point is created with great care during the warping of the threads and later at the time of their mounting on the loom
- The heddles are tied in their upper end to a rod which supports them and their bottom ends are tied to the treadles and thus by stepping on the treadles causes the lifting and dropping of the heddles, moving the threads between the reed's slits (on a horizontal loom) forming the shed

TOOLS/ OTHER ELEMENTS USED IN WEAVING

THE RAKE




Elena Găvan photos

- Weaving wooden tool with teeth arranged at a certain distance like a comb
- One of the sides is removable
- It is used in the process of assembling the warp threads on the loom

TOOLS/ OTHER ELEMENTS USED IN WEAVING

SPINDLES

- A kind of rectangular bars usually flattened used in the process of assembling the warp threads on the loom
- Purpose: preventing the entanglement of warp threads
- Made of dried wooden rods (hazelnut branches), wood or cardboard

TOOLS/ OTHER ELEMENTS USED IN WEAVING

THE REED

- The reed is a system of slits vertically placed on both ends forming a comb-like figure placed on a frame; the warp threads are inserted through its slits
- purpose: it supports the warp threads as they penetrate the heddles following the exact order created by the shed; it controls the density of the warp through the density of slits and the number of weft threads through the force used to beat the threads
- Components: two parallel bars, 2 and 2 between which thin wooden slits are placed at an equal distance between them.
- material: hazelnut wood (the slits), oak (for the frame), poplar
- In the past were made by specialized craftsmen

TOOLS/ OTHER ELEMENTS USED IN WEAVING

THE REED

ASTRA Museum` photos collections.

TOOLS/ OTHER ELEMENTS USED IN WEAVING

SPECIAL TOOL

- Special tool used to pass warp threads throught the reed

TOOLS/ OTHER ELEMENTS USED IN WEAVING

SHUTTLE

ASTRA Museum` collections.

- Usually made of hard wood (beech, hornbeam, plum tree)
- Shape: a long wooden frame that holds a tube with weft threads
- Purpose: inserting the weft thread in the warp shed

TOOLS/ OTHER ELEMENTS USED IN WEAVING

TINDEICA/STRETCHER

ASTRA Museum` collections.

- Made of iron or hard wood
- Purpose: holding the cloth stretched
- Position: placed on the width of the cloth
- Shape: narrow bar with uprights on both ends; usually made of two pieces inserted in each other and tied with the help of a small nail through the holes which help the stretching and narrowing of the object

TOOLS/ OTHER ELEMENTS USED IN WEAVING

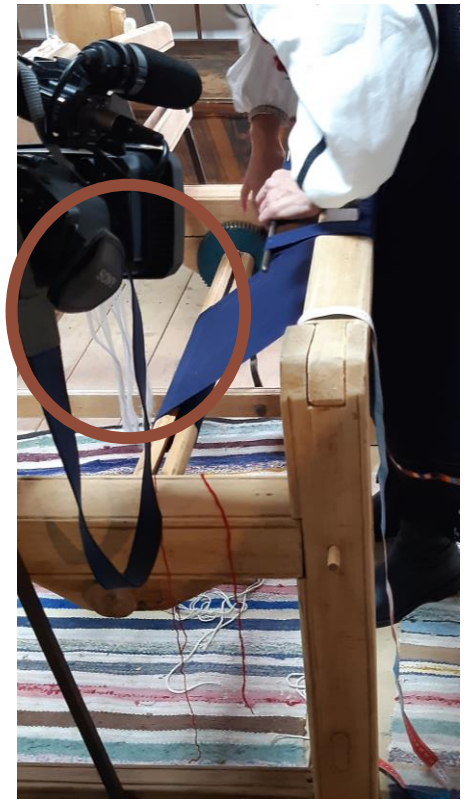
TINDEICA/ STRETCHER

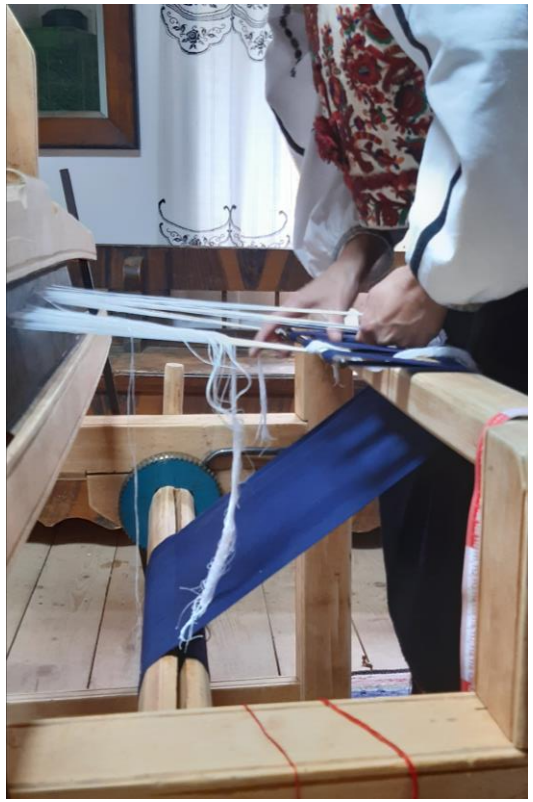
Two piece metal stretcher

ASTRA Museum` collections.

TOOLS/ OTHER ELEMENTS USED IN WEAVING

NODURAR





Mounting on loom. Elena Găvan photo.

- A piece of cloth that is mounted, at one end, on the roll in front of the loom; at the second end of the cloth the warp threads are tied so that the weaving process can begin

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

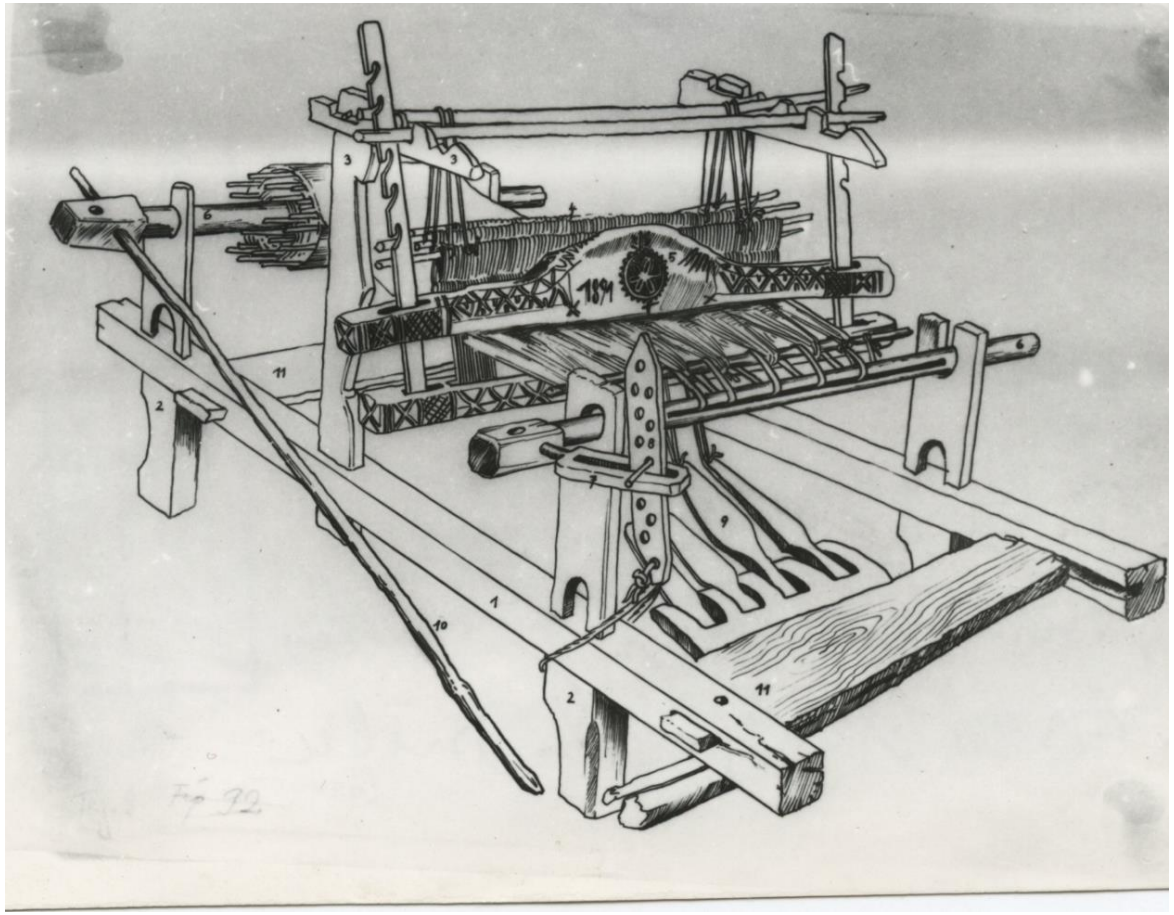
THE DECORUM OF THE LOOM

- Upright posts decorum

- Feet decorum

ASTRA Museum` collections.

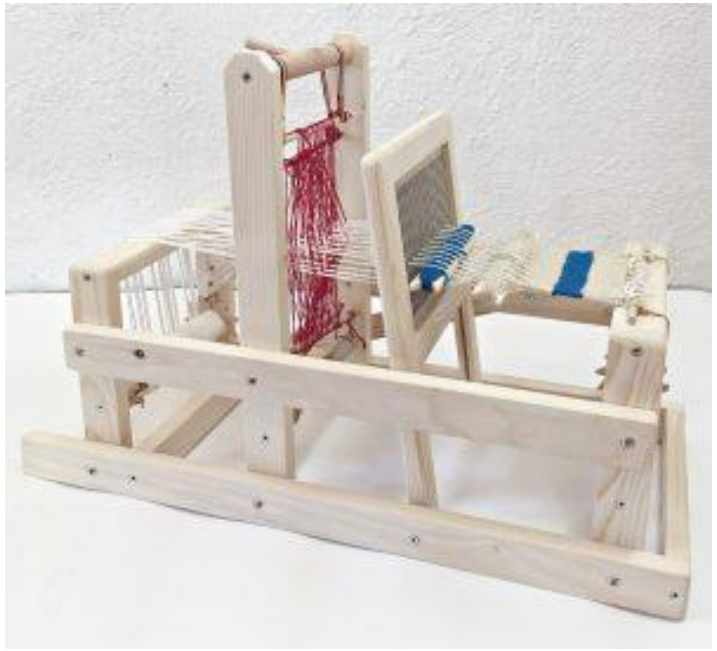
THE DECORUM OF THE LOOM



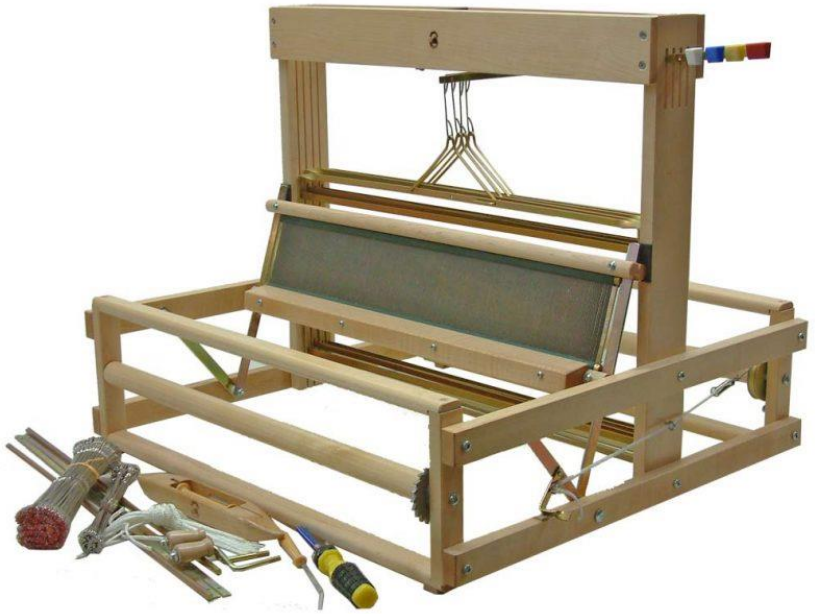
- Decorations means to communicate and express feelings, the expression of the artistic gift of the carpenter or of the weaver; the loom's protection if it is placed inside a house, indoors

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/

TYPES OF LOOMS FOUND TODAY

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

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

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Types of Looms | Textile Weaving - YouTube

https://www.youtube.com › watch