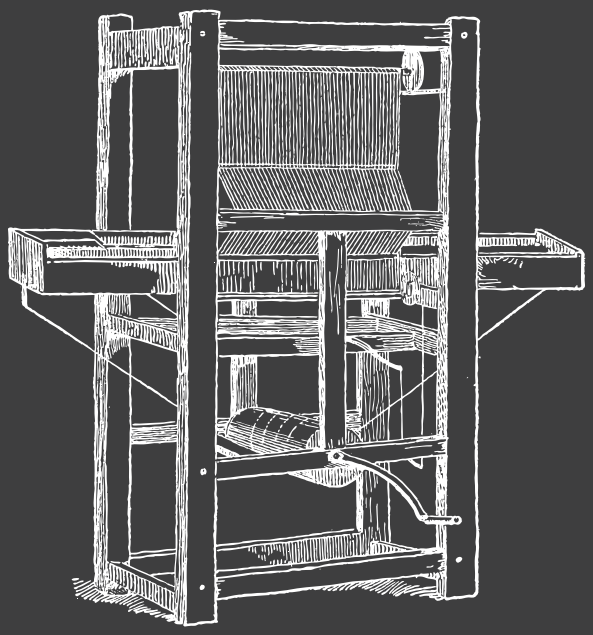
CRAFTSMANSHIP+



FOSTERING A NEW AND COMPETITIVE APPROACH TO CRAFTS AND SEMI-INDUSTRIAL HIGH ADDED-VALUE SECTORS

The Art of Weaving Loom

PORTUGAL

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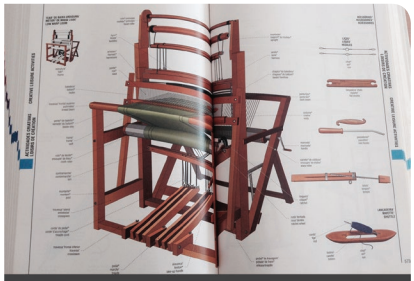
CRAFTSMANSHIP

The Art of Weaving Loom

CONTENTS

1 | BASIC CONCEPTS



tear-esquema

The Art of Weaving Loom

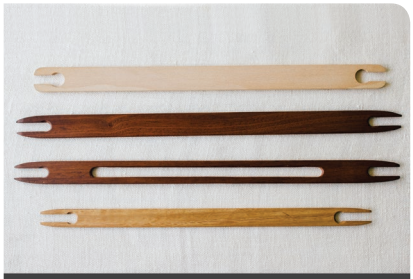
LOOM AND ITS COMPONENTS

- Hedle
- Shafts
- Treadle
- Cloth beam
- Warp beam
- Reed
- Beater
- Weft
- Warp
- Ruler
- Countermarch
- Treadle cord
- Crank handle

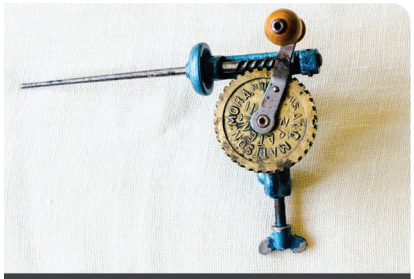
TOOLS AND MATERIALS

- Warping board
- Shuttle
- Flat shuttle
- Bobbin winder
- Bobbin
- Reed hook
- Shears
- Measuring tape
- Ruler
- Yarn
- Strip of cotton or other thick cord for temporary knots

Shuttle

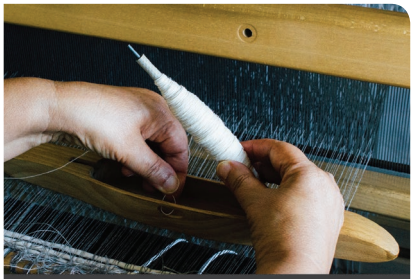


Flat shuttle



Bobbin winder

Warping board



Bobbin

Reed hook

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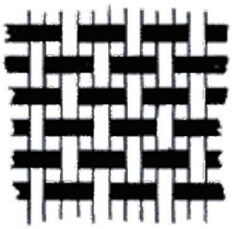
2 | FABRIC STRUCTURES

Weaving is performed by an orthogonal crossing of two parallel yarn systems, the warp and the weft, according to several sequences, in order to create different structures. Although fabrics can exhibit very diverse looks, structurally there are only 3 fundamental structures: tabby, twill and satin, which allow an infinite number of derivations and compositions. Any fabric produced in a loom is based on one or more of these 3 yarn cross forms.

TABBY

Tabby is the most basic weaving structure and it distinguishes itself by the alternating interweaving of the weft yarns and the warp. Each weft yarn passes under 1 warp yarn and over the next, and so on and so forth, creating a checkered effect.



Tabby

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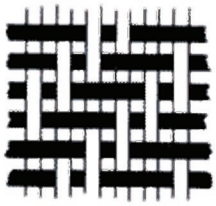
TWILL

Twill distinguishes itself by the passage of the weft yarn under 2 warp yarns in a row and over the next 2, creating an advance of 1 yarn in the next passage. This sequence and the misalignment between passages creates its unique pattern of parallel diagonal lines.



Twill

SATIN

Satin distinguishes itself by the passage of the weft yarn under 1 warp yarn and over the next 4, creating a discontinuity between interlacements. Due to the fewer interlacements, this structures creates more fluid fabrics, in which one side the weft yarn is more visible and on the other side the weft yarn is more visible.

Satin

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3 | WEAVING DIAGRAMS AND HOW TO READ THEM

Fabrics can be represented graphically through diagrams that provide us with all the necessary guidance to produce a specific fabric. The format we use here is the most common, but they can be depicted in several ways.

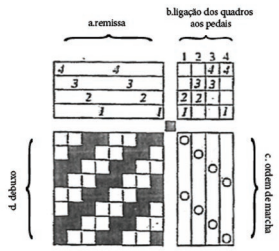
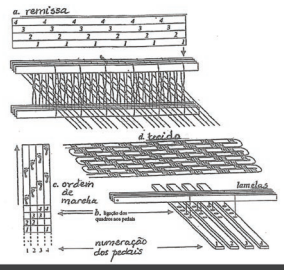


Diagram for neutral twill



Loom with connection to the diagram of neutral twill weaving

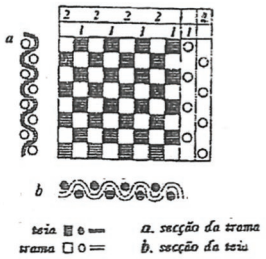


Diagram for tabby weaving

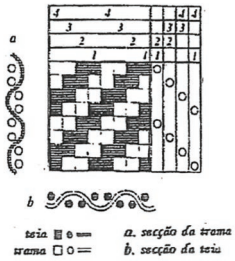


Diagram for twill weaving

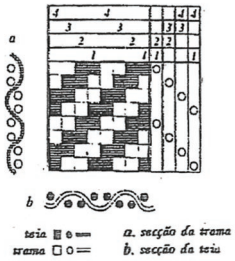


Diagram for satin weaving

1 **Threading:** always depicted in the horizontal axis. It states the sequence in which the warp yarns should be laced into the shaft heddles. Each horizontal line represents a shaft and the numbering indicates the warp yarn threading sequence. Threading is determined in the building phase of warp in the loom.

2 **Shaft to treadle connection:** this connection is represented in the junction of the vertical axis and the horizontal axis. It shows which shafts should be connected to which treadles, in a way that the treadling produces the chosen fabric structure. Each vertical column represents a treadle. The shaft numbers that should be connected to it are present in that column.
Usually, each weaver has its loom permanently tied with a set of shaft-treadle connections that allow him to execute his most frequent fabric structures, changing only the warp threading and the treadling to produce different fabrics.

3 **Treadling:** always depicted in the vertical axis and specifies which treadles should be activated in order to produce the desired fabric.

4 **Drawdown:** represents the resultant fabric effect of the instructions contained in the other 3 quadrants, through a scheme of positives and negatives. The dark squares represent warp yarns and the light squares represent weft yarns.

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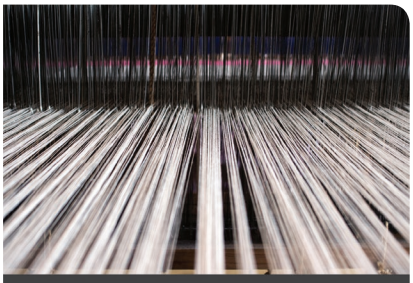
4 | WARP CALCULATIONS

Warp is the set of longitudinally disposed yarns forming part of the fabric. In looming, these are the yarns that are kept in tension in the weaving preparation (also in the longitudinal direction).
Before we weave a warp it is required to have a design in mind that'll define which type of fabric it will consist of: which structure it will have, if it's dense and heavy, or looser and lighter. For this demonstration we will produce a small set of pieces with warp and weft linen, with a thickness of 35cm and length of 180cm each.
Performing the calculations of the warp entails, once the design has been established, calculating the sett and the length of the yarn warp to weave.


Warp yarns longitudinally arranged in the loom


Warp yarns longitudinally arranged in the loom


Warp yarns longitudinally arranged in the loom and fabric

WARP SETT

The sett of the warp is defined by the number of yarns that exist per centimeter.
To decide this value we can simply grab a ruler and roll over the unit of the centimeter the same yarn we're going to use on the warp, spreading the yarns according to the sett that we desire.
More yarns per centimeter will create a denser warp, while less yarns per centimeter will result in a lighter warp.
In this case, we opt for a sett of 6 yarns per centimeter.
To know how many yarns our warp will have, we just need to multiply the number of yarns per centimeter by the width of the pieces we're going to weave. So, if we're going to weave pieces with a width of 35cm and a sett of 6 yarns/cm, our warp will have a grand total of 210 yarns (35cm x 6 yarns).


Establishing warp sett

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WARP LENGTH

The length of the warp depends on a set of factors that must be taken into account separately:

1 **Length of each piece and the number of pieces that are going to be produced with the same warp:** if we're going to weave three 180cm pieces, we'll need 540cm of warp length.

2 **Take-up the tissue:** take-up is a "shrinking" effect of the warp resulting from the curvature of the interlacing between the warp and weft yarns during the weaving. This interlacing causes the warp yarns to cover a bigger extension than the linear length of the piece we're weaving, since the warp yarns will circle the weft yarns between the upper and lower part of the fabric. Take-up is influenced by 3 factors: the thickness of the weft yarn, the beating of the warp and the fabric structure. The thicker the weft yarn, the more take-up it generates, as it creates more distance between the upper and lower part of the fabric, forcing the warp to cover a bigger distance between the two sides. The more we hit the weft, or the denser, more take-up is generated as well. Regarding fabric structures, the more interlacement it has (yarns caught in the warp), more take-up is generated. As each fabric structure has a different interlacement number, this choice directly affects the take-up rate. For example, tabby is the structure that generates more take-up while satin is the one that generates less, due to its low interlacement count. However, warp sett and fabric structure are only relevant in the computation of very long warps, namely those used in industrial production. In our scale of work, these two factors won't be taken into account. The factor we'll take into account is the thickness of the weft yarn and in this case we designate only 10% over the length that we set initially for the pieces that we are going to weave. That is, to weave 3 pieces with a total extension of 540cm, we'll add a 54cm margin of take-up.

3 **Gap between pieces:** the gap between the pieces we'll weave is something that should be established in the design, because it can contemplate hems of variable length, long fringes or it can be even nonexistent. In our design we'll have 20cm margin between each 2 projects (each piece will have a margin of 10cm in each extremity).

4 **Waste:** waste results from the length of the warp that is retained between the conclusion of the project and the ties in the back ruler when it comes close to the back of the shafts, and also because of the extension of length used in the ties of the warp. The value to consider varies according to the equipment used and the warp assembling method, but using the loom and the method here described, we estimate 40cm of total waste.

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In short, the length of the warp will have to take into account the following factors:

TOTAL LENGTH OF THE PIECES TO BE WOVEN
+

FABRIC TAKE-UP
+

GAPS BETWEEN PIECES
+

WASTE

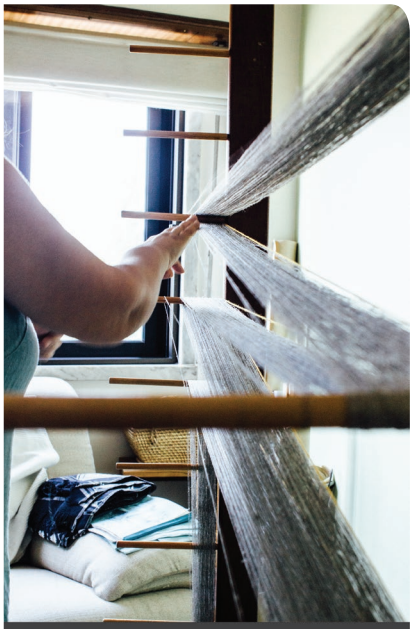
In our specific case, we'll have to count 540cm of length for the to-be woven pieces. 54cm of take-up rate, 40cm for the gap between pieces and 40cm of waste, which totals 665cm of total length to be warped.

In our project for 3 linen pieces with 180cmx35cm width, sett of 6 yarns/cm, we'll warp 210 yarns with a length of 665cm.

5 | WARP WINDING

Weaving the warp means to display the yarn in a parallel and organized way, in the desired length, in a way to be assembled in the loom to begin the weaving. It is accomplished by resorting to a warping board, which is usually formed by a set of pins arranged in a wall or a spinning wheel.

1

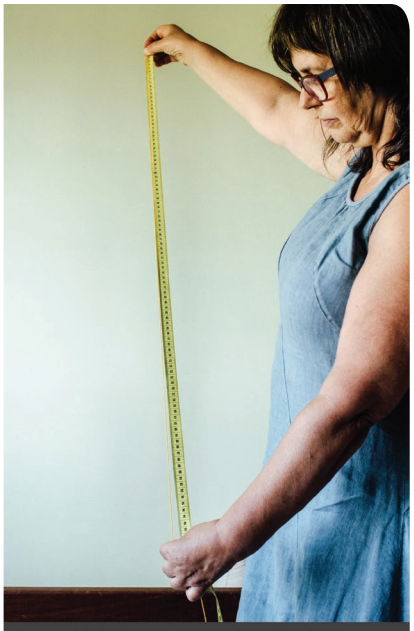


2

1

Warp winding comprises the following steps:

Measure and cut a yarn-guide: the yarn-guide is a yarn that has the same length of the warp and a bit more so we can tie it in the warping board pins. It should also possess a very visible color, as it will be used to pave the way of the warp yarns in the warping board, easing up the initial work.
With the yarn measured and cut, we tie one of the ends in the first pin and we trace a path in the warping board that receives the full extension.
In one of the extremities of the warp, we should be careful to have 4 consecutive pins to do the cross later.



Cut the yarn-guide with the desired length for the warp

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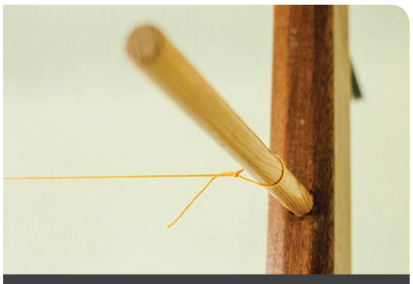
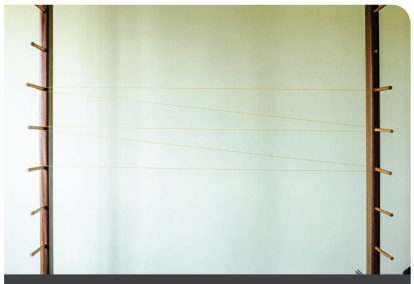
2

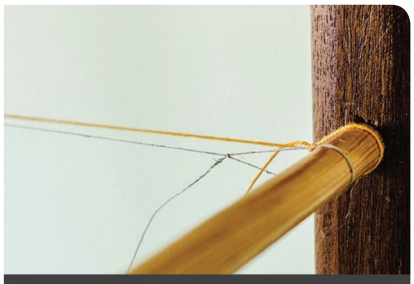
First and second warp passage: we tie the beginning of the yarn with which we are going to weave in the first pin and we cover the traced path made by the yarn-guide.
When we reach the last 4 pins we cover the same path as the yarn-guide. Between the 2nd and the 3rd pin we cross the yarn to the inner side of the pins.
When we reach the 4th and final cross pin, we surround it to make a second passage, in reverse.
In this second passage, when we reach the point between the 2nd and 3rd pin once again, we cross to the opposite side of the yarn in the first passage.
This crossing will repeat in this same location for each passage of the warp yarn, creating a cross of alternated yarns in the shape of an “8”. The cross is essential because it allows us to alternate the yarns in a way to keep them separate and organized sequentially in order to be correctly assembled in the loom. Alternating the yarns also eases the counting, since we only need to count half to know how many were woven.



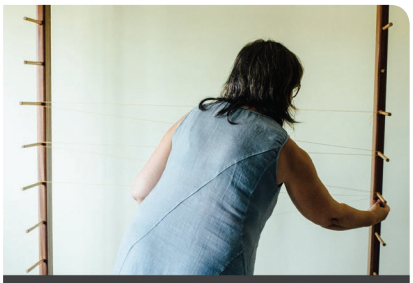
Tie one of the ends of the yarn-guide in the first pin of the warping board



Pave a way in the warping board that can receive the full extension of the yarn-guide



Tie the extremity of the yarn with which we're weaving in the first pin, alongside the yarn-guide



Cover the same path as the yarn-guide

1

2

With each passage, alternately cross the yarns between the 2nd and 3rd pin, creating a cross in a shape of an “8” in the last pins of the warping board.

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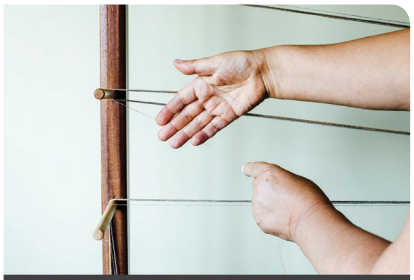
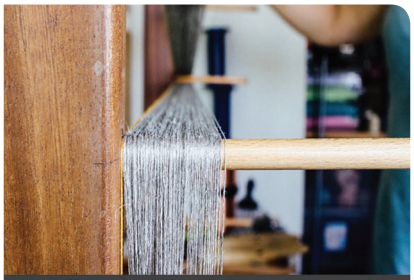
3

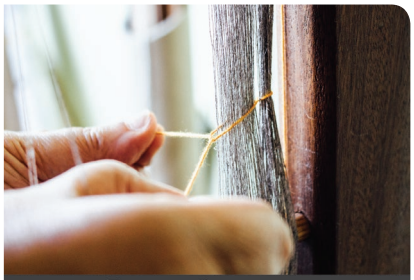
Weaving the warp: we repeat this process between the first and last pin of the path, mindful to always create the cross, until we complete 210 passages, which is the required number for our warp.
During the process, we should make sure that all the yarns keep the same tension, which should not be excessive, otherwise we'll end up with a shorter warp when it's removed from the warping board.
As we make the passages, it is also important to get the yarns to the inside of the pins, being careful to keep them aligned and parallel.
To confirm the number of passages already made, we can count the number of yarns on one side of the cross. Since the wires are alternated, we only need to count half. To ease up the count and to make sure we don't end up with extra or less yarns, we can tie them in groups of 20 or 30 already counted.
With the 210 passages over, it is time to remove the warp from the warping board.



Throughout the whole process, it is important to keep the yarn aligned, parallel and with the same tension between them.



Throughout the whole process, it is important to keep the yarn aligned, parallel and with the same tension between them



To ease up the counting, we can tie the yarns in a cross in groups of 20 or 30

After the 210 passages, it is time to remove the warp from the warping board

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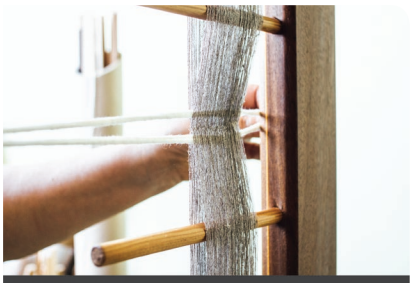
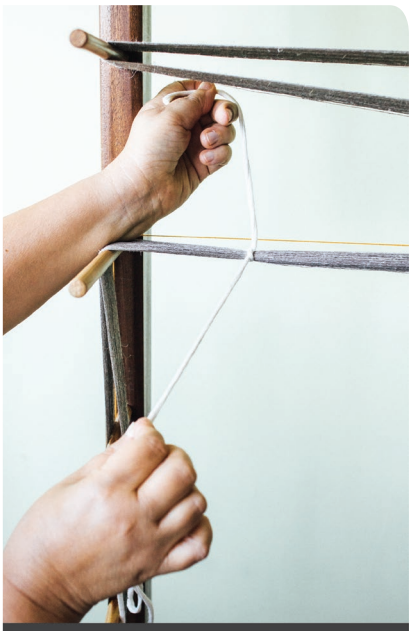
4

Tying the warp: to remove the warp from the warping board and keep the yarn order that we carefully established in the beginning of the project, it is required to execute ties in key-places.
We can use any thick thread to this end.
The first tie is made in the center of the cross. The second tie is made above the cross. The third tie is made under the cross. There's even one more tie in the other extremity of the warp (at the beginning) and any other interim tie that may be necessary to prevent the yarns from loosening.



First tie at the center of the cross

Make one more tie in the beginning and any other interim ties required to prevent the yarn from loosening.



Second tie above the cross

Third tie under the cross

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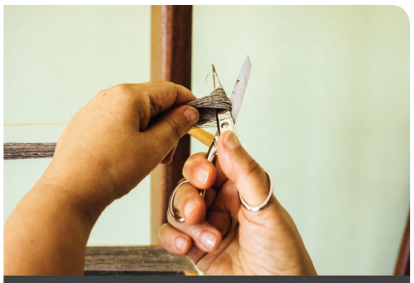
5

Removing the warp from the warping board: With the required ties executed, the warp yarns will be cut in the extremity where we started to weave. With them we create a warp chain that will help us keep the yarns organized between the removal of the warping board and the beginning of the placement in the loom. This warp chain will prevent the yarn from becoming disorganized and entangled before they reach the loom.
With the full extension of the warp chained, we use the ties from the 2nd warp tie to strap the end of the chain and we cut all the yarn from the final extremity.
At the end of this process we should have 210 yarn arranged alternately and parallel, ready to be placed in the loom



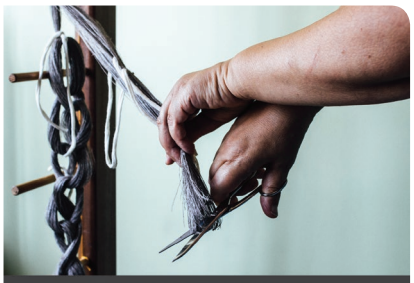
To remove the warp from the warping board we begin cutting the yarn in the first pin

Make a chain warp to avoid the yarn to become disorganized before it goes the loom

Make a chain warp to avoid the yarn to become disorganized before it goes the loom

Use the yarn from the 2nd tie to strap the end of the chain warp

Use the yarn from the 2nd tie to strap the end of the chain warp



Cut the yarn of the final extremity of the warp yarn

The warp is finished and ready to be assembled in the loom

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6 | WARP ASSEMBLY

Assembling the warp means to arrange it in the loom in a way that makes it ready to begin the weaving. It is during the warp assembly that the sett, width and fabric structure(s) are defined.
The denting will define the sett and width of the fabric. The threading in heddles and the tie-up will define the possible fabric structures.
It becomes essential to understand how to choose the correct reed for the work we're going to produce, as well as the threading in the reed and the heddles before we begin this process.

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LOOM REED: HOW TO CHOOSE THE CORRECT REED AND HOW TO THREAD

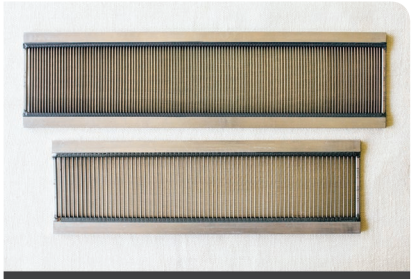
The loom reed is a component which is used during the weaving process to do the beating of the weft, ensuring that it will be well positioned in the fabric. It also serves to organize the warp yarn that enters the loom, by keeping them parallel and separated; it helps define the sett of the warp and to control the width of the fabric.

The reed used in the loom should have a proximate or exact match to the sett that we defined for our warp. There are several reeds with diverse dent setts. Each possesses a numbering that is directly linked to the sett of the warp yarn. For example, a reed 6, per centimeter, has 6 dents. This numbering is only used in the reeds for manual looming.

In the beginning of our project we define a sett of 6 yarn/cm for our warp. Therefore, we can use a reed 6, which matches exactly the sett of the warp defined in the beginning – or, in the lack of thereof, we can use a reed of approximate sett, being careful to spread the yarn evenly and rhythmically, so there is density consistency throughout the warp.

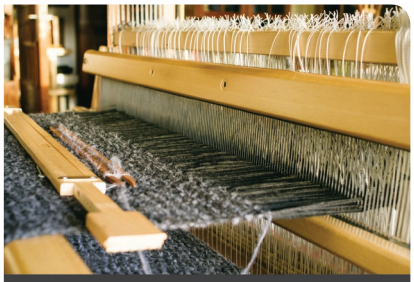
If we use a reed 6, for each dent of the reed will only go through one yarn, but for our demonstration we'll use a reed 4, which will help understand how we can bypass the situation, in the event we don't have an exact matching reed.

Using a reed 4 for a warp that should have 6 yarn/cm sett requires the spreading of 6 yarns for each 4 dents. To ensure the warp is evenly arranged, we need to find a threading rhythm for the 6 yarns in the 4 dents, that we can repeat throughout the 35cm of our warp. We'll have a rhythm of 1-2-1-2 for each centimeter (each number of this sequence indicates the number of yarn entering a dent groove).
So, before we assemble the warp in the loom, we have to choose the reed that we're going to use according to the sett of the warp that we established for our project and, in case the reed doesn't match the warp sett, the rhythm of the threading in the dents.



Reeds in stainless steel

The reed is used during the weaving process to beat the weft, ensuring that it is well positioned in the fabric



The reed organizes the warp yarn that enters the loom, keeping them parallel and separate

Threading rhythm 1-2-1-2 to spread 6 yarns evenly for each 4 dents of the reed 4

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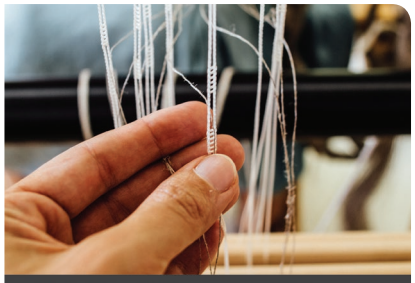
HEDDLES AND SHAFTS

Fabric structure is determined by the threading of the warp in the heddles of the shafts of the loom and the tie up.
Before we assemble, we consult the weaving diagram to know how many shafts will be used and the order and sequence of the threading in the heddles and shafts.
Concerning the tie up, usually, each weaver already has his loom permanently tied with a set of tie ups that allow him to execute the most frequent fabric structures in his work, simply modifying the warp threading and the treading to produce different fabrics.
For our project we decided to weave a twill that, according with the weaving diagram, requires 4 shafts.
For our guidance, each shaft is assigned a number of 1 to 4, being that the shaft number 1 is the one at the head of the loom. Each shaft possesses countless heddles that we can use according to our needs and the width of the warp that we're going to assemble.

According to the twill diagram, the warp yarn will be threaded in the heddles in a sequence of 4 yarns, each progressively entering in a heddle of each of the 4 shafts, from the front to the back: first yarn in a heddle of the first shaft; second yarn in the heddle of the second shaft; third yarn in the heddle of the third shaft; fourth yarn in a heal of the fourth shaft.
With the first 4 yarn sequence threaded, we'll repeat this threading sequence for the next 4 yarns and so on and so forth until we have all of the warp yarn threaded.

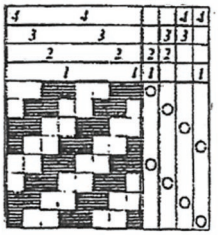
The shafts support the heddles, through which the warp yarn goes through while they're being assembled in the loom



The heddles guide the warp yarn with the purpose of separate and guide them in the formation of the shed

Fabric structure is determined by the threading of the warp yarn in the heddles of the loom shafts and also by the treadle

Fabric structure is determined by the threading of the warp yarn in the heddles of the loom shafts and also by the treadle



Neutral twill diagram

According to the twill diagram, the warp yarn will be threaded in the heddles in a 4 yarn sequence, each progressively entering one of the 4 shafts front to back

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Assembling the warp

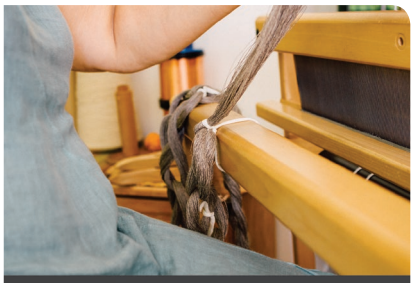
Warp assembly can be accomplished from the front of the loom to the back or in the opposite direction. There are two different methods depending on personal preference.
We'll execute a warp assembly from the front of the loom to the back, because it offers some advantages. The first is the possibility of executing the assembly without the help of a second person, which is not possible when we execute the assembly from the back to the front. The second is to waive the use of the raddle, since threading of the warp in the reed in the first place spreads them properly before they enter the heddles. Assembling the warp in the loom front to back, making the yarn pass first through the reed and only then through the heddles is a method that provides more work autonomy and eliminates a full step in the whole process.

Assembling the warp in the loom comprises the following steps:

1 Marking the center of the loom to ensure our piece is centered.

Mark the center of the loom

2 Tying the 2nd tie of the warp to the frontal loom bar..



Strap the 2nd tie to the frontal loom bar

3 Securing the cross in the loom bar.

Secure the cross in the loom bar

Secure the cross in the loom bar

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4

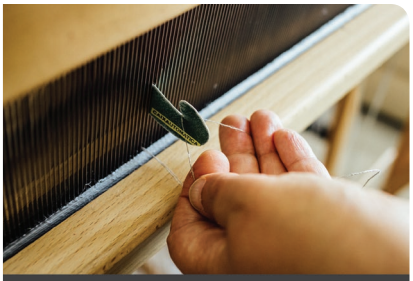
Measuring and centering the width that we want for our piece (in our case – 35cm).

Measure and center the width that we desire for our piece

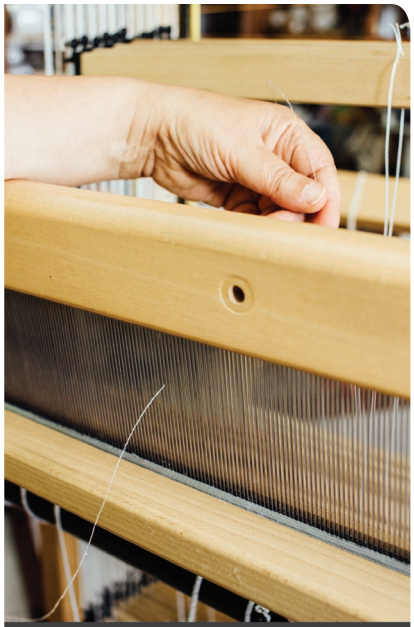
5

Separating the leftmost yarn and, with the help of the reed hook, threading it through the leftmost dent in the width that our piece will occupy in the reed.

Separate the leftmost yarn and, with the help of the reed hook, thread it through the leftmost dent in the length that our piece will occupy in the reed



Thread the first yarn through the leftmost dent in the width that our piece will occupy in the reed



Thread the first yarn through the leftmost dent in the width that our piece will occupy in the reed

6

Pass the same yarn through a heddle eye of the first shaft indicated in the threading.

Pass the same yarn through the eye of a heddle of the first shaft indicated in the threading

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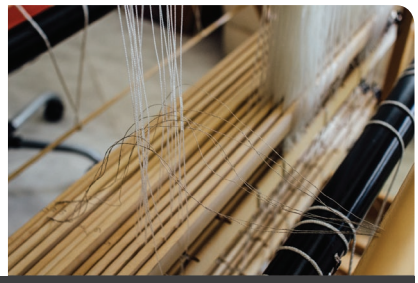
7

Execute the sequential threading of each warp yarn that we secure in the loom bar, following this order of passage: first through the reed and then heddle, taking into account the threading rhythm in the reed that we previously defined (6 yarns for each 4 dents in a rhythm of 1-2-1-2) and the threading of the shafts matching the twill.

Execute the threading of each of the warp yarn, taking into account the entry rhythm of the pre-viously defined reed (6 yarns for each 4 dents in a rhythm of 1-2-1-2) and the threading of the twill

8

Tie each set of 4 yarns that already went through the reed and heddles with a blind knot.



Execute the threading of each of the warp yarn, taking into account the entry rhythm of the pre-viously defined reed (6 yarns for each 4 dents in a rhythm of 1-2-1-2) and the threading of the twill

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9

Execute this whole threading process until all the warp yarn has been threaded through the reed and heddles and tied in groups of 4.

Execute this whole process until all the warp yarn has been threaded and tied in groups of 4

10

Tie the groups of 4 yarn warp to the ruler of the beam behind the loom, two by two, as specified in the images.

1

2

3

4

Tie the groups of 4 warp yarns to the ruler of back beam of the loom, two by two

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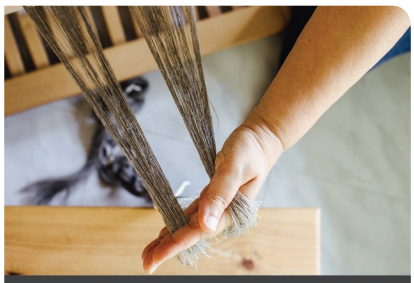
11

Keep the yarn in tension at the front of the loom, begin the winding of the warp in the back beam.

1



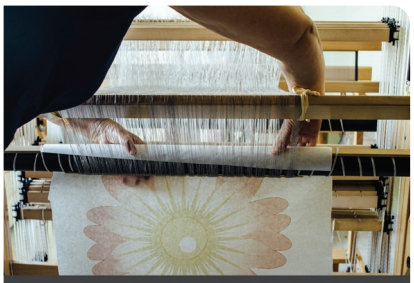
2

3

Keeping the yarn in tension on the front of the loom, begin rolling the warp in the back beam

12

During the whole warp winding process in the back beam, it is necessary to ensure that the yarn remain parallel and with the defined width for the fabric. For this reason, we separate the different yarn layers with rice paper in order to keep them parallel between each other, avoiding that the yarns “slip” in the empty slots between them, creating distortions. All of these small attentions to detail are dedicated to keep the parallelism of the warp yarn in order to avoid distortion in the work later when we loom.



Separate the different yarn layers with paper sheets to keep them parallel to each other

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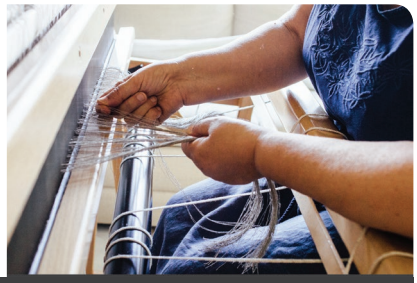
13 Roll all the warp in the back beam, keeping the tension even and uniform, until we only have enough extension to tie the extremity of the yarn in the front ruler of the loom





Roll the warp in the back beam until there's only enough extension to tie the yarn in the front ruler

14 Tie the extremities of the warp yarn in the front ruler in the way we already did for the back side, ensuring that they stay centered and evenly tense. First we begin by tying the yarn at the middle to the center of the ruler, then we tie the yarn at the left and right alternately.



Tie the warp yarn in the front ruler, ensuring that they are centered and evenly tense

15 Our weave is now being assembled and the loom is ready to work, not without checking for errors in the threading.

Warp assembled and loom ready to weave

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7 | WEAVING

During the weaving process we'll execute the orthogonal cross of the warp and weft yarn. The fundamental steps of the weaving are repetitive and always executed in the same order.

1

2

Beginning at the moment the reed is positioned behind and the shed is opened, we follow this step sequence:

1

Shuttle passage: with the reed positioned behind and the shed opened, we pass the shuttle or the flat shuttle that carries the weft yarn from one side to the other of the warp yarn.

Passage of the shuttle

2

Beating of the reed: pulling the reed to the front, we beat the weft yarn, so that it is properly placed in the fabric.
The beating of the reed has influence in the sett of the weft yarn. A more beaten fabric will have tighter weft yarn, creating a denser fabric; a less beaten fabric will be less dense.

Beating of the reed

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3

Treadling: we tread on the pedals to lower/raise the shafts according to the established treadling in the diagram, executing the shed opening which, creating an opening between the warp yarn that move in opposite direction, will allow the passage of the shuttle.

Treadling

Treadling

4

Backward movement of the reed: pushing the reed back, we go back to the initial position with the shed opened and ready for a new shuttle passage.

Reed movement to the back

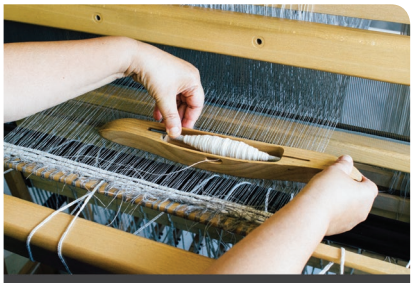
Shed opened and ready
for a new shuttle passage

Before we begin weaving with the chosen yarn for our weft, we make some passages with a thicker yarn to stabilize the beginning of the fabric.
Then, we fill the bobbin with the definite yarn by using the bobbin winder, we fit it in the shuttle and we begin the weaving of the fabric following the treadling sequence of the shed of the shuttle/beating of the previously mentioned reed.
As we weave, it is required to release warp from the back beam and roll the fabric in the front beam.
As we work, we should also perform with the fabric relaxed. For this, we allow a little slack to the fabric by unlocking the front beam, so it stops being in tension, and we make the measurement. To prevent the unrolling of great extensions of fabric to measure, we can mark the last measured point with a baby pin, doing the measuring each 20cm, for example.

Initial passages with a thicker yarn to stabilize the beginning of the fabric

Initial passages with a thicker yarn to stabilize the beginning of the fabric

Filling the bobbin in the bobbin winder



Fitting the bobbin in the shuttle

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GLOSSARY

Tie:
ties that are made at several points of the warp, after warp winding is concluded and before being removed from the warping board, in order to keep the yarn fixed until they're assembled in the loom

Reed support:
bracket where the reed is secured.

Weft beating:
beating the weft.

Shed:
opening between the warp yarns that move in opposite directions, allowing the passage of the shuttle that carries the weft yarn.

Bobbin:
tubular piece used to store the yarn that is fitted in the shuttle.

Bobbin winder:
device used to fill the bobbin with yarn to be used in the shuttle.

Satin:
one of the three basic fabric structures, executed by passing the weft yarn under 1 warp yarn and over the next 4, creating a discontinuity between interlacements.

Cross:
section of the warp extremity with a yarn interlacing in a shape of an "8" executed during the warp winding process in order to keep the yarn sequentially separated and organized for the loom assembly.

Drawdown:
weaving diagram quadrant that represents the resulting fabric effect through a layout of positives and negatives. The expression "drawdown" is also used in the course that teaches how to craft weaving patterns and other effects.

Diagram:
graphical representation of the fabric structure that give us the required instructions for the weaving process by establishing the threading, the tie up and the treadling.

Swift:
Device that turns horizontally and that allows to transform the skein into balls of thread.

Take-up:
"shrinking" fabric effect triggered by the curve of the interlacing between the warp and weft yarn during the weaving.

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Beating the weft:
beating of the reed in the weft yarn in the weaving process, right after the shuttle pass.

Threading:
warp yarn insertion in the reed grooves and the heddle eyes, according to the specific sequence linked to the fabric structure to be produced.

Structure:
how the weft and warp will shape and interlace to give birth to different fabrics.

Shuttle:
boat shaped accessory with a bobbin inside, whose function is to transport the weft yarn through the shed.

Interlacement:
point where the warp yarn entwines with weft yarn.

Heddles:
cords or wires parallel to the shafts, through which the warp yarn pass in order to separate them e guide in the creating of the shed.

Flat shuttle:
piece used to store the weft yarn and guide it through the shed.

Ball winder:
device that transforms the yarn in ball threads without a center.

Heddle eye:
opening of the heddle through which the warp yarn goes through.

Treadling:
sequence in which the loom pedals are trodden in order to raise and lower the shafts that lead to the creation of the fabric we want.

Warp beam:
coil of the backside of the loom that serves as storage for the warp that will be used in th e weaving.

Cloth beam:
coil of the front side of the loom that serves as storage for the fabric that is being created.

Selvedge:
fabric side margins.

Reed hook:
tool used to pull the yarn through the reed dents and the heddle eyes.

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Treadle:
Loom component linked to the shaft that makes it go up and down in order to weave the fabric we want.

Treadling:
same as “treadling”.

Reed:
Loom component through which the warp yarn is passed in order to execute the beating of the weft.

Dent:
reed grooves.

Shaft:
frame or pair of horizontal bars that support the heddles.

Threading:
graphic representation of the warp threading in the heddles.

Raddle:
auxiliary tool used when assemble the warp in the loom from the back to the front, in order to evenly spread out the warp yarn before it goes through the heddles.

Twill:
one of the three basic weaving structures, identifiable by the parallel diagonal lines that are formed when the weft yarn goes under 2 sequential warp yarn and over the next 2, creating a 1 yarn advance in the next pass.

Tabby:
the most basic weaving structure, characterized by the alternate interlacing between the warp and weft yarn.

Loom:
Machine that weaves fabric.

Weave:
the process through which the fabric is produced. Weaving implies an orthogonal crossing of a parallel weft and warp yarn systems, which can be used on various types of loom.

Fabric:
textile surface created through the orthogonal crossing of the weft and warp yarn.

Warp:
set of yarn longitudinally arranged that make up the fabric structure. The same name is given to the set of yarn longitudinally arranged that are kept tense in the loom, ready for the weaving.

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Temple:
ruler with cogs at its extremity that is fixed is in the fabric to prevent tugging during the weaving. The temple helps keeping the width of the fabric consistent.

Weft:
set of yarn arranged transversely that make up part of the fabric structure. Yarn that cross transversally with the warp yarn during the weave.

Weaving a warp:
all the required yarn arranged in a parallel way in order to create the warp with the assistance of the warping board.

Warping board:
tool used to weave the warp, composed by a set of pins arranged in the wall or a rotating device.

Warp winding:
weaving the warp.

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