Backstrap Looms

The backstrap loom, an example of which is shown to the right, is deceptively simple. For the most part, it consists of sticks, rope, and a strap that is worn around the weaver's waist. This strap is how the backstrap loom received its name. This simple technology means that almost anyone can own a backstrap loom and that the loom can be set up almost anywhere. This mobility allows the weaver to work indoors or outside, at a neighbor's house or in the marketplace, while keeping watch over the children or while chatting with friends. And the backstrap loom can be adjusted to fit any weaver, from the child learning to weave to an adult master weaver.

Using the backstrap loom, a weaver can produce fabric with a plain weave. Most simply, this is an over-under-over-under pattern.

Unlike the treadle loom, the backstrap loom allows the weaver to brocade designs into the fabric as it is woven. Brocade can be woven with a supplementary weft, added along with the ground weft. The elaborate brocading of huipils has given Mayan weaving its distinctive character.

A = A cord or rope is used to tie the loom to a tree or post.

B = End bars are used to hold the warp (vertical threads) to the upper and lower ends of the loom.

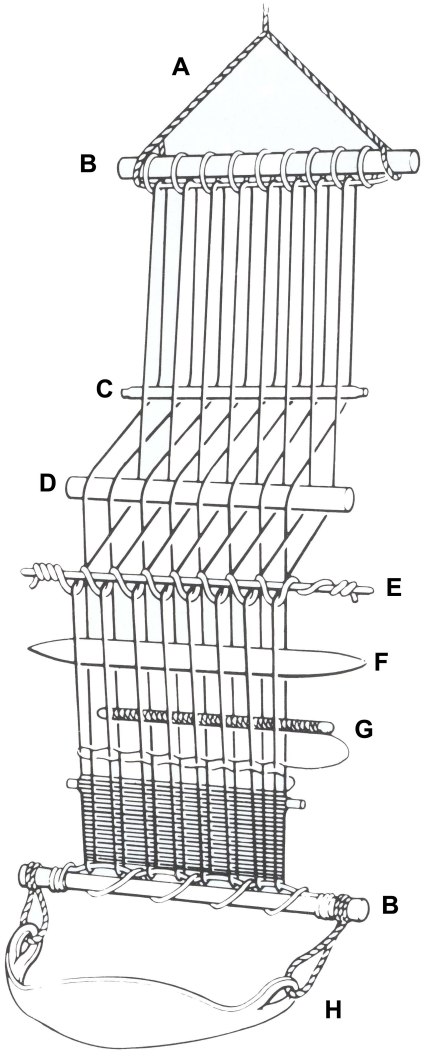
C and D = Shed rods maintain the crossing of the warp's threads.

E = The heddle rod lifts alternate threads of the warp.

F = The batten helps to separate alternate threads of the warp to allow the bobbin (G) to pass through them. The batten can also be used to tighten the weft (horizontal threads) as they are woven.

An orange deer brocaded on a black background; from a Kekchi ceremonial huipil.

For a comparison of backstrap and treadle weaving, see this page.



G = The bobbin, containing the thread of the weft, passes from side to side between the warp.

H = This belt is worn around the weaver's back and connects her to the loom. The weaver controls the tension on the warp by leaning backward or forward.

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Weaving Technology

Home

Reinventing the Loom:
A Simple Frame for Experiments

Marla Mallett

I often encourage collectors of Middle Eastern rugs and other tribal textiles to experiment with a few of the simplest weaving techniques. Handling some yarns and interlacing or wrapping them yourself is guaranteed to help you understand the structures better, and increase your enjoyment of the textiles. Also, it's fun. Often when I am puzzled by a woven detail, I reach for a simple frame loom that I keep warped and handy. By trying out unfamiliar techniques, I make sure that I understand them correctly. A big, fancy loom is not necessary for that.

Here, we will "reinvent" basic loom mechanics from scratch -- step by step. Then, with my manual, *WOVEN STRUCTURES*, at hand, you can try whatever basic techniques you wish.

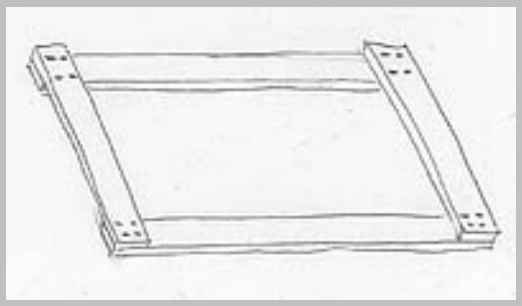
I suggest that in the beginning you weave a narrow "sampler," trying several techniques and experimenting with various weights of yarn and warp spacing. After that you can use the most satisfactory methods and materials to produce an actual finished piece.

A Picture Frame Loom

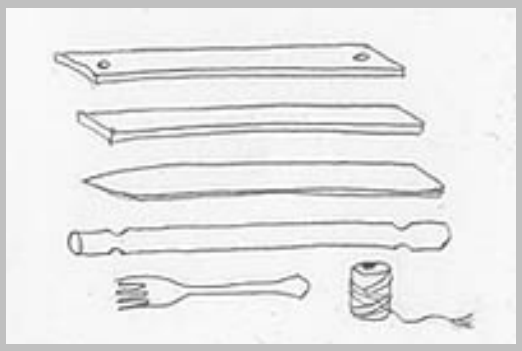
Here's a list of the parts you will need:

1. First, a frame. Easiest of all is to rummage through your attic, basement or garage to see if you can find a sturdy old picture frame. Remove the glass, and Presto! You have a loom. Thirty to forty inches in the greatest dimension is ideal, but other sizes will work too. It does not need to be wide for experiments. If the wood has rough spots, give them a swipe or two with sandpaper.

Alternately, you can build a simple wooden frame of 1 by 2-inch boards. You need not miter the corners -- instead, the frame is stronger if crosswise end pieces are simply nailed, screwed or bolted to the front of the long side pieces. When you think about the size, keep in mind that your weaving cannot be the full length of the frame. 12 to 15 extra inches of warp are needed for opening a shed.



2. A wooden slat for a *shed stick.*
Wood lath is a perfect size: 1½ inch wide by ¼ inch thick, and as long as your frame is wide. Drill a hole near each end.



3. A extra wooden slat or two may be useful for tension control.
These should be about the same size as the shed stick, but holes are not necessary.

4. A wooden slat with one end shaped in a flat, tapered point, if possible, for a *pick-up stick* or *weaving sword*. Same size as the pieces above. You can saw out the basic shape of a point, then taper the side edges of this point with a rasp, and finally sand it smooth. It is not essential that you have this piece to get started.

5. A wooden dowel for a *heddle bar*. A thickness of ½ inch is good. Cut notches or grooves near each end.

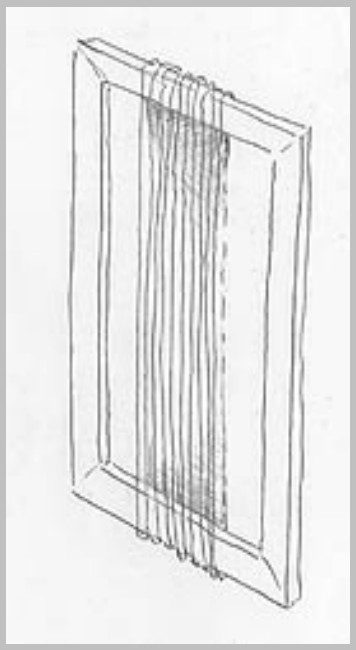
6. A common table fork for a beater; also scissors, and twine.

Yarns

At your neighborhood weaving, needlework or craft supply shop, look for sturdy wool yarn that is tightly spun and plied to use for warp yarns. Rug, tapestry or knitting wools are OK for wefts, but I suggest you avoid fluffy yarns. You will need perhaps two or three colors for wefts, and none should be heavier than your warps. A still thinner wool weft yarn will also be useful -- preferably in a neutral color or one similar to your warp color. You will also need some twine for heddles.

[Note: Because wool is so resilient, it makes a better warp for use on a small frame loom than cotton or linen.]

1. Warping Your Loom



Tie your warp yarn around the bottom end of the frame and then wrap that yarn around and around the frame lengthwise. Try not to stop until you are finished, so the tension is even. End by tying on to the bottom end of the frame. The yarns should be fairly taut, with just a bit of flexibility. Where they round the frame, place them about ¼ inch apart. Your weaving can be whatever width you wish, although a 5 or 6-inch width is probably good for an experimental sampler.

2. Twining

For this first weaving, I suggest that you combine the two layers of yarns by pulling them together at the lower front end of the frame with a row of *twining*.

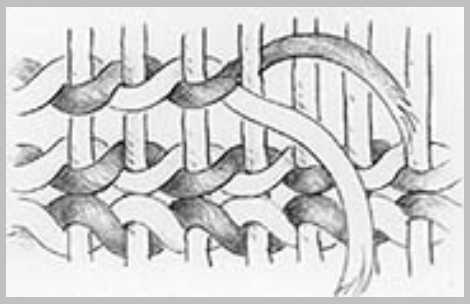
Cut a separate length of sturdy yarn at least 3 times the width of your warp. Place the center of this twining yarn at the left side of the warp, with one end below the first warp yarn, and the other on top. Enclose this first warp by twisting the two yarn ends together. Tighten, then repeat, enclosing the second warp, then the third, etc. Enclose yarns alternately from the top and bottom layers. Always twist the twining yarns in the same direction. You will probably need to do a little "adjusting" until you get the hang of twisting the yarns evenly. You can pull the warp yarns sideways, one after another, to tighten and even up this first row of twining if necessary. After you have twined all the way across the warp, take whatever time is necessary to space everything evenly on the frame. The warps should be close together, but not touching -- perhaps about 8 per inch. You can adjust the spacing by twining with a thicker or thinner yarn. Finish the twined row with an overhand knot.

You have now already learned one of the world's oldest and most basic textile construction techniques. The photo shows an ancient Peruvian fabric (a mummy wrapping) made entirely with widely spaced rows of twining. This is a tedious way to make a fabric, indeed, but it is an excellent way to secure and space your warp yarns evenly.

Before we go on, you might want to try twining with two colors. Just knot a light and dark yarn together, and start with the knot at the edge. After one row of this two-color twining, try reversing the direction of twist in the next row, to produce a decorative chevron effect, as in the lower part of the drawing. This is *countered twining.* You could try enclosing two warps between twists if you wish. This is *two-span twining,* and is what you see in the Peruvian fabric. You could twine with several yarns together and span still larger groups.

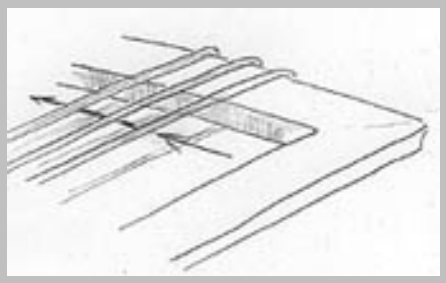
Some weavers have done fancy patterning by changing span lengths or changing the way they have twisted

yarns. The textile on the cover of *Woven Structures* shows a complex twined Moroccan fabric.

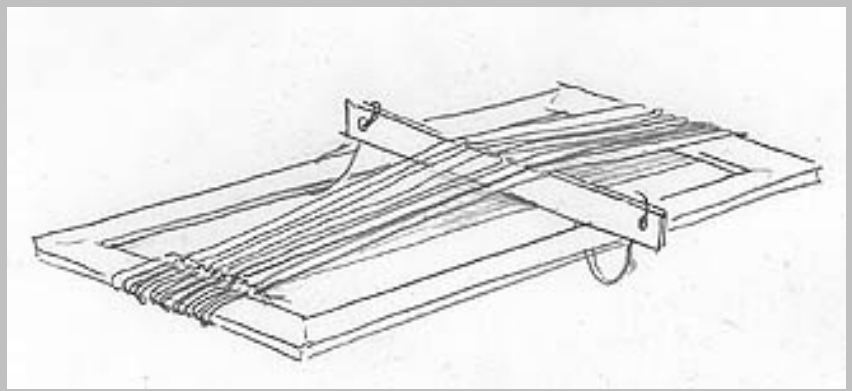


3. A Shed Stick

Since you now have a taut, even warp, you could do several kinds of simple constructions with no further loom refinements. To make a *plain weave*, you could just interlace weft yarns by hand, one by one, over and under the warps; then pack them into place; then interlace over and under the opposite warps. This is SLOW though!



You should quickly discover that your frame loom produces a *natural shed* that separates the warps into two groups, since your warp yarns are held apart where they encircle the far end of the frame. Insert a wooden lath (the one with holes drilled near the ends) through this slight opening, and you have a *shed stick* -- a basic loom part.

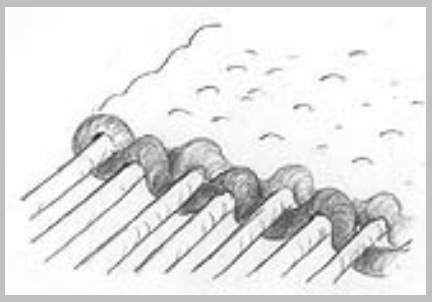


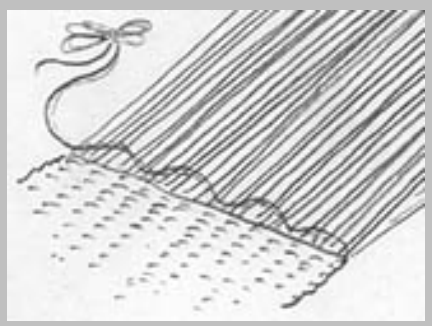
By turning this slat on its side, you can widen the space between alternate warps, making a *shed* through which you can easily insert your weft. To keep this shed stick from slipping out, thread a piece of twine through each hole, then encircle a side of the frame, tying each to form a very loose loop. The slat must be free to move easily back and forth.

4. Weft-Faced Plain Weave

Now you're ready to weave! Get comfortable, with one end of the frame in your lap and the far end propped on a convenient table. Pull the shed stick toward the center of the frame, and turn it on edge. Put your first weft yarn through the wide open shed.

Here's the MOST IMPORTANT PART OF THE LESSON: We need to give the weft some extra slack, so that when it is packed into place it can take a sinuous path, snaking up and down, over and under the warps. One way to do this is by "bubbling" the weft -- by placing it in an arc, then pressing it down part way in scallops. Just a couple of scallops will probably be enough on your narrow warp. Then you can press the weft into place with your beater -- your handy table fork. There are other ways of inserting and packing wefts, but this is an easy way to start. (I prefer to start where the weft is joined, and use a rocking motion with the fork to consistently coax a little extra weft into place, but this takes some practice.)





By providing this extra yarn length -- or *weft ease* -- you allow the wefts to cover the warps completely, making a *weft-faced weave* that is typical of all kilims and the ground weave in a majority of Middle Eastern tribal pile rugs. Rugs woven without enough weft ease often tell us that the weavers were beginners, or were weavers without a lengthy tradition behind them, as such a structure is not compact. Inserting the wefts without enough ease can also cause a weaving to "draw in," and become narrower. Inserting wefts inconsistently results in a crooked weaving.

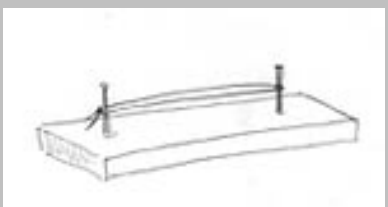
For the second weft, you will have to interlace the alternate warps by hand. There is no way to use two shed sticks together. If you don't believe me, try inserting one either in front of or behind that first slat! Instead, to produce a plain weave you must alternate, first using the shed you can produce with the shed stick, and second, interlacing by hand. If you have made a pointed *pick-up stick* you can use it to select or "pick up" the proper warps to lift for your second shed, then turn this stick on edge to open a clear shed for your weft. Be sure to "bubble" each weft before packing it into place. You of course have to remove this pick-up stick before you can open the next shed. Well.....after you've done this for a while, I'm sure you will agree that it's a laborious way to make a fabric! Primitive peoples everywhere produced plain- weave fabrics this way, however, before inventing HEDDLES!

5. Hallelujah! Heddles! and a Heddle Bar!

Heddles are one of the greatest inventions of all time! All around the world, ingenious weavers came up with the same idea, revolutionizing weaving technology. All other loom refinements pale in comparison.

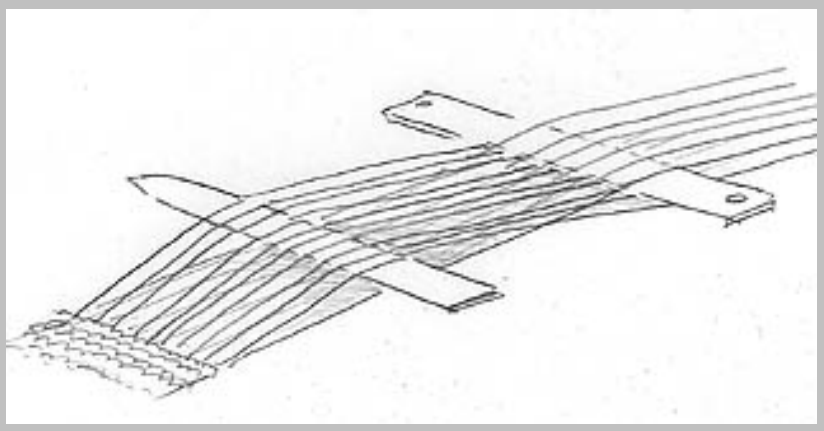
By attaching string loops around those warp yarns that lie UNDER the shed stick, you can lift them -- once your shed stick is flattened and pushed back out of the way. By putting a series of such loops on a rod, you can lift all of the selected warps together!

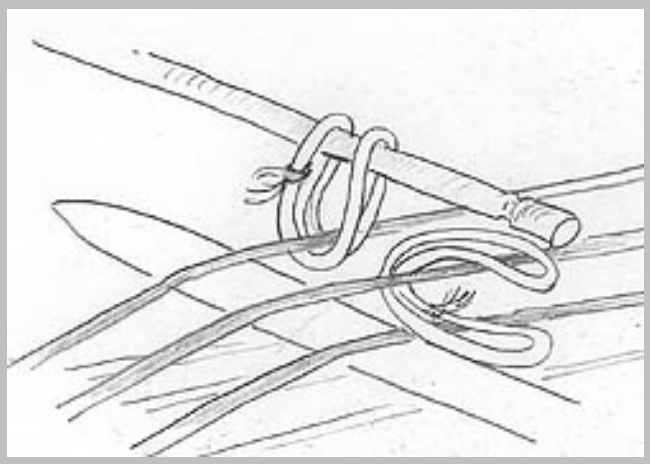
Most tribal weavers use a continuous string to make a series of heddle loops. Since these can slip and slide and become a tangled, uneven mess, I'll describe my favorite foolproof method for klutzy weavers.



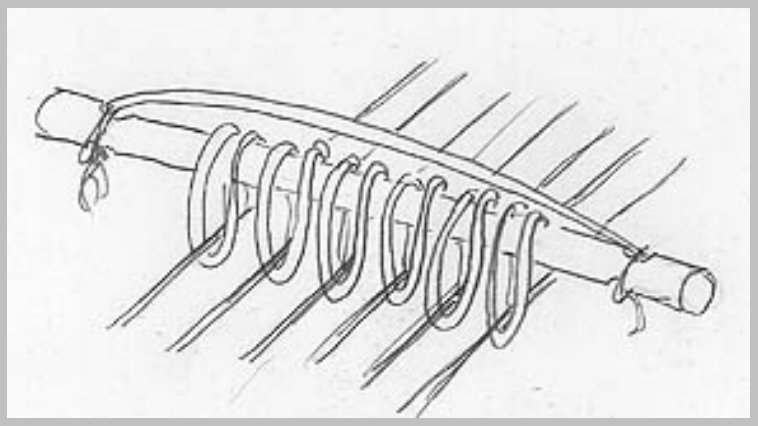
First, make a series of identical separate string loops. I like to pound two nails (without heads) into a board about 7 inches (18 cm) apart, and tie my heddle loops around them. If you have a total of 60 warps, you will need 30 heddles. You can use them over and over again for future weavings.

Now, back at your loom, with your pointed pick-up stick, pick up all of the warps that lie UNDER your shed stick. Do this IN FRONT of the shed stick. This means BETWEEN the shed stick and the area in which you weave. If you haven't made a pick-up stick, use one of your extra slats, or a ruler. Even a knitting needle will work. The warps you have picked up are the ones you will enclose with heddles.





Slip one end of your first heddle under the first raised warp. Then put both looped ends over your *heddle bar* -- your notched dowel. Then do the same with the next, and the next. When finished, take a separate string and tie around one notched end of the dowel, then bring it along the rod to the other end, and tie it around that notched end. This will keep all of the heddles safely on the dowel. Now, with separate short strings, tie onto each end of the dowel and make loose loops around the loom frame, as you did with your shed stick. Tie these so that they form long, loose loops.



THAT'S IT !!! Like magic, you can now open TWO different SHEDS on your loom. To weave, you first pull the *shed stick* forward and turn it on edge, insert your weft, bubble it, and pack it down; then for the next shot, you flatten the shed stick and push it to the back, out of the way, and pull the *heddle bar* upward to open your second shed. Do this half way between the shed stick and the fell (front edge) of the cloth. Insert your *pick-up stick* in the space you have opened and turn it on edge to hold the shed open while you insert a weft.

All around the world, this is the basic loom mechanism used by primitive weavers. No matter how loom frames are constructed, the shed-making operations are essentially the same. Nomad weavers who stake front and back beams to the ground, instead of using rigid frames, still create their sheds with heddle bars and shed sticks.

[Note: Most Asian rug weavers actually fix their heddle bar shed in an open position, and only move their shed stick. I've explained that method in *Woven Structures Update 2, Anne Rowe Review,* but it is not practical for a small frame loom.]

In place of a shed stick, some weavers have used a second heddle bar. To do fancier weaves, like twill, more heddle bars are needed to lift various combinations of warps. For most of the basic Middle Eastern tribal weaves, however, only two alternating sheds are required. These weaves are referred to by Western artisans as "non-loom-

controlled techniques."

You might want to wind some weft yarn around a simple stick shuttle, although for a small weaving I find that is too much trouble. Like most rug or tapestry weavers, I prefer to make a small "butterfly" with my weft yarns... winding them in a figure eight around my thumb and first finger, then binding them around the middle. In use, the first yarn end can be pulled from the center of the small finger skein. Or you can just make a small wad of yarn that is easy to put through the sheds. A ball does not work well, as it is too thick, and is also hard to handle.

6. Techniques to Try

Now you're on your own. First, try to produce a nice weft-faced weave. If the wefts do not cover the warps, then you may need THINNER weft yarns (NOT thicker!!!), or you may need to space your warps a little farther apart. To do this, try *twining* with a slightly heavier yarn. When you are doing a plain weave, you can easily make crosswise stripes of course, but then try alternating two colors to see how weavers produce their *pick-and-pick* weaves with small vertical columns of color. You will have to twist the two weft yarns together at the selvage. Don't forget to bubble the wefts.

Then try some TAPESTRY techniques (Chapter 6 in *Woven Structures*). *Slit tapestry* is easiest, and you can try weaving separate sections: first with short vertical divisions between colored areas, then diagonals. But, again, don't forget to bubble the wefts! You can try weaving in one narrow, small area, and then curve wefts around it. You might try some *dovetailing* -- sharing warps between pattern areas. Then try *interlocking* wefts.

SOUMAK wrapping is easy on a frame loom, (Chapter 5) and you can try both *countered* and *non-countered* variations. I suggest that you use a thinner yarn for ground wefts between your rows of wrapping. Try any variations that have might have puzzled you -- *reverse soumak*, for

example. Try *weftless soumak,* a variation used by early weavers who had not yet discovered heddles. You will see that it is a much less stable structure.

KNOTTED PILE is easy (Chapter 2). Try each kind of knot with a short length of yarn first, and then try to figure out how you would tie it with a yarn end if that yarn was still attached to a ball. Asian weavers do it that way: tie and cut, tie and cut. Westerners usually work with a butterfly and continuous yarn, cutting a row of pile loops afterwards. *Symmetrical knots* may be the easiest at first. Experiment to see if using a single yarn makes thick enough pile; you might need two yarns together. Or maybe even more if your yarns are fine. Use a fine yarn for your ground weave between rows of knots, bubbling the weft for best results. It will be easiest to leave your pile fairly long, and use several ground wefts between rows of knots, as does a *gabbeh* or *tulu* weaver.

If you try some BROCADING, be sure to realize that your ground weft yarns need to be much thinner than your patterning yarns (Chapter 8). Tribal weavers usually just interlace each yarn separately with their fingers, but you can use the pick-up stick to select yarns for the pattern if you wish. The same is true for COMPLEMENTARY-WEFT weaves.

***Woven Structures* is not a "how-to-do-it" book, but between the diagrams and text, you should be able to experiment with most of the basic structures. Warp substitution and double weave are the exceptions; they require complete directions as well as more heddle rods. Warp twining must be done on cards, and that technique makes a fascinating study for anyone who enjoys learning new constructions.**

7. A Further Loom Refinement

Several years ago, one of my clever weaving students devised an ingenious addition for our simple frame looms. William Murray (in back, in the photo) rigged up a heddle bar on the underneath side of his frame, then attached a long cord and a treadle! John Dickey is using such an arrangement in the photo.

This speeds up the weaving considerably, and makes a simple frame quite convenient for tapestries and other small weavings. A shed stick is still used for one shed, and alternates with the treadle- operated heddle-bar shed. One could, of course, make a second heddle bar and treadle to substitute for the shed stick, but the advantages of this would be less dramatic.

With your frame warped as I have described above, you can simply turn it over to work from the back, and try attaching a long cord and treadle to the heddle bar. Ease the shed stick to the top side of the frame.

8. Warp-End Finishes Anyone?

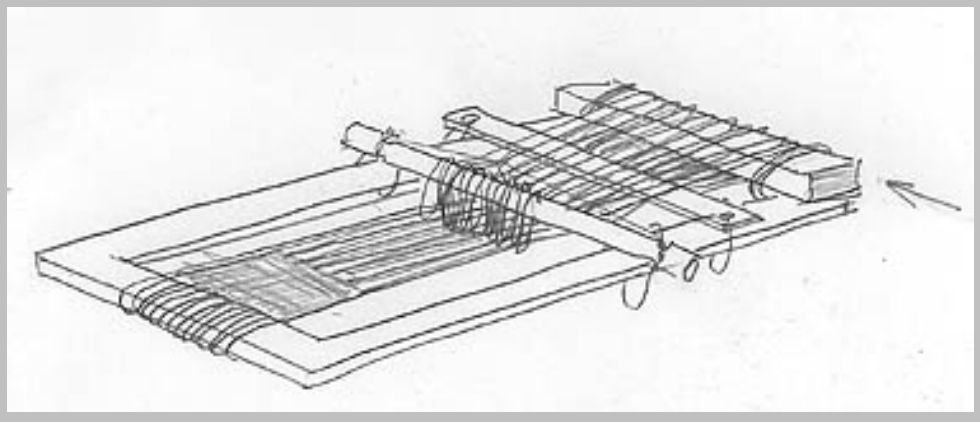
Several of the warp-end finishes included in our End Finishes Project database (*Woven Structures Update - 4*) are difficult to understand without trying them out. Here is an easy way to start:

Find a piece of heavy, but loosely woven fabric. Turn under and stitch a thick hem along one edge. Then with a heavy yarn needle, stitch lengths of yarn through that hem to simulate 10 or 12-inch rug fringe. Presto! A Warp-End Finish sampler. If the yarns are not secure, you may need to stitch twice through the fabric with

each length. Now go to the End Finishes pages and with the diagrams you should be able to duplicate the structures. Among the easiest to begin with are *half-hitch* finishes.

Questions or Problems?

If the warp on your frame loom becomes loose and saggy, you can insert an extra slat or two under the warp at the top end, and lash these slats to the frame. It's an easy and effective solution.



The most difficult achievement for new weavers is a good *weave balance,* and it is hard to offer advice on this without seeing your yarns. So be patient and experiment a bit with putting warp yarns closer together, farther apart, etc. If you have problems, e-mail me, and I'll try my best to help. As I think of suggestions, I will post them here.

END FINISHES PROJECT

Woven Structures Update

When we try to determine where village or nomad rugs and bags were made, small details can be informative. Although weavers may use a variety of materials and may change the scale of their weaves to suit their objects, they tend to use the same end finishes, selvage constructions, and other distinctive techniques consistently--on both flatwoven and knotted-pile objects.

On these pages I will discuss several *warp-end finishes* and illustrate variations on each. The goal is to accumulate a small data base showing the range of rugs or weavings with each basic structure. Decorative flat-weave borders that embellish the ends of some pile rugs and bags are not truly end finishes, but because they have been frequently misunderstood, they are included. Daniel Deschuyteneer is working with me on this project; indeed, it was his interest that prompted it.

I urge you to participate by sending photos of your rugs, along with close-ups of their end finishes or decorative borders and as much technical information as possible. I will try my best to answer questions you may have. *For suggestions on what to send, click here*. Accurate labels may be a problem with some of the rugs shown, so if you have ideas about their derivation, please let me know.

To view each group below, click on its heading.

Marla Mallett

WHAT'S NEW ON THESE PAGES:

Pieces with unusual details have been added to the *Warp Loops* page: a twined tapestry Bedouin tent panel, and a twill tapestry South Persian moj. A Yezidi Kurd rug has been added to the *Bands of Oblique Wrapping* page. Two West Persian rugs with wrapped *Heading Cords* have been added to

the database, an intriguing Sivas yatak with a *Two-pick Interlaced Band* and other interesting details, and a dated Caucasian rug with soumak and knotted meshwork. These are courtesy of Daniel Deschuyteneer, Mehmet Kiliç, Mike Tschebull, and Filiberto Boncompagni. Many thanks to them!

On a temporary page, I am collecting photos of village and nomad Asian looms to use in discussing the relationships between warping procedures and end finishes. I will greatly appreciate help from anyone who comes across an interesting picture.

Heading Cords

Warp Loops

Bands of Oblique Interlacing

Bands of Two-Pick Oblique Interlacing

Looped Wrapping

Bands of Oblique Wrapping

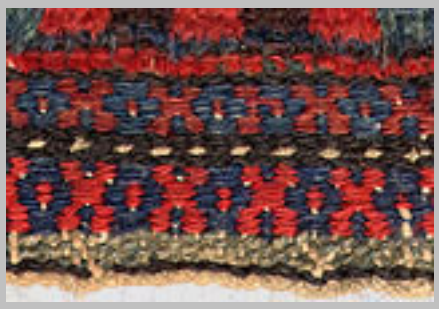
Twining

Half-Hitch Bands

Knotted Meshwork

Weft-Substitution Borders

Brocaded Borders



Complementary-Weft Borders

Assorted Twill Patterns

Asian Looms

» **How to participate in this project**

Some of the structures shown on these pages are much easier to understand if you try them out. Near the bottom of the *Updates - 5 page* I have shown a way to set up a sampler for experiments.

LINKS: Participants in the project

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Looped Wrapping

We frequently find rows of either *twining* or *soumak* wrapping at the ends of our village and nomad rugs. These constructions are not only decorative, they help to combine or separate warps, and to space them evenly across the loom. These details are often used along with warp loops or heading cords.

Looped wrapping

On the Bijar saddle cover below we see another structure-- *looped wrapping*. It is indeed unusual. At a glance it appears so much like ordinary soumak, that I suspect we have overlooked examples. I suggest that when we examine NW Persian rugs we look closely to see just where, and on what kinds of pieces, this detail appears.

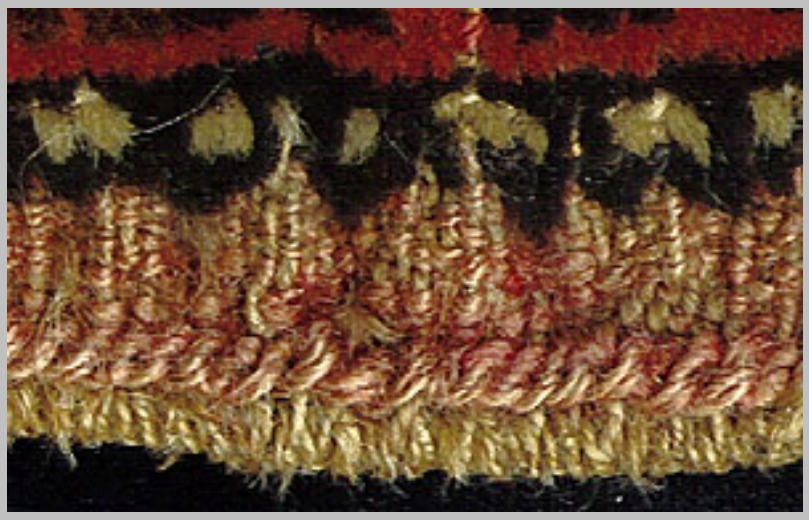
Ordinary soumak wrapping

In textile terminology, "loop" has a specific generic meaning: the yarn locks by crossing itself. Although the term has been used inaccurately in descriptions of various structures, in this case it applies. The yarn simultaneously wraps and locks, making a secure foundation against which to begin packing wefts.

The tiny detail below was nearly impossible to capture in a scan; the small loops behind and slightly above the large diagonal spans are hardly visible. By probing with a needle, however, the structure is easy to identify.

Bijar Saddle Cover
36" x 41" (91.5 cm. x 104 cm.). Late 19th century.

STRUCTURE: Symmetrical knots; H: 12, V: 12, 144 per square inch. (H: 47/dm, V: 47/dm, 2209 per square dm). Discontinuous wefts and weft inlays. Complete warp depression.
YARN SPIN: Z.
WARP: 2-ply ivory/brown wool.
WEFT: Tan wool singles, sometimes 2 tan wool singles; 2 picks.
PILE: 1 or 2 wool singles; 3 used occasionally.
SELVAGES: Not original.
UPPER END FINISH: Plain weave.
LOWER END FINISH: Plain weave; looped wrapping with 2 pink wool singles; plain heading cord.
[AA-70. Allan Arthur]



The *looped wrapping* in this saddle cover is directly above a plain heading cord. Details like this, with localized use, may have great diagnostic value if more examples are found. (Front)

Bijar Knotted Pile Rug. Northwestern Iran
3'6" x 7'3" (165 cm x 343 cm)

STRUCTURE: Symmetrical knots, H: 9, V: 8, 72 per square inch (H: 34/dm, V: 32/dm, 1088 per square dm). Complete warp depression.
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFTS: Heavy 2-ply taut ivory wool alternates with 2 sinuous peach wool singles.
SELVAGES: 1 warp pair, overcast with red wool singles. The overcasting interlocks with each taut weft.
LOWER END FINISH: A wrapped heading cord is followed by a row of 4/2 soumak; then a row of looped wrapping across half the rug, with a row of 4/2 soumak on the other half. Next come countered rows of 4-span black and white twining, and two more rows of 4/2 soumak. There are no wefts in the end band, merely one heavy plain-weave pick before the knotting begins. (See the *Heading Cord* page for a back view.)
[AA-1005. Allan Arthur]

The row of red wrapping just under the black and white countered twining is *looped wrapping*. Unfortunately, it is even more difficult to see the structure in the photo here than on the saddle cover above. This specialized structure only extends across half of the rug. Two people must have been at work here...one who was familiar with this structure and thought it appropriate, and one who had other ideas. The first, third and fourth rows are all ordinary 4/2 soumak.

There are no ground wefts in this band. The heading cord has been wrapped with yarns similar to the warps.

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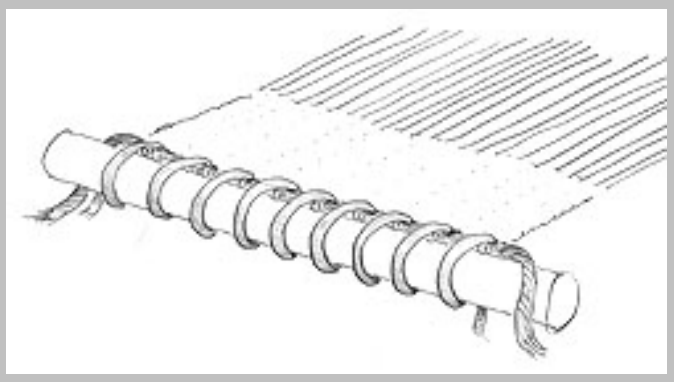
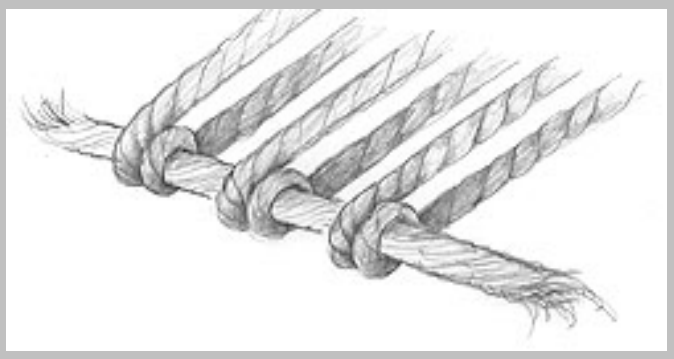
Heading Cords

A *heading cord* can provide a neat, trim, uncut finish for a rug, bag or cover's LOWER end--the end where the weaving begins. At the upper end of the rug the warp is cut, and another finish is necessary because extra warp space is required there for the heddles and shed stick and for opening a shed.



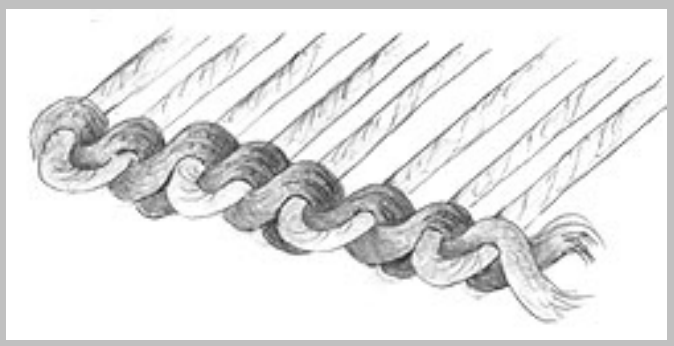
Because heading cords result from a relatively primitive approach to warping the loom, they are important diagnostic features. A heavy crosswise element--either a cord or several yarns together-- is incorporated as the warp is wound. When the warp is transferred to the loom, the heading cord is lashed to the loom beam; then the weaving can proceed. This temporary lashing is shown in the first drawing.



A *plain heading cord,* as in the second drawing, is made by encircling a heavy cord along with the end post when the warp is wound. The warps are, of course, crowded together, not separated as in the drawing.

A *twined heading cord* is shown in the third drawing. As the warp is wound, the two ends of a heavy cord are twined through the warps along the end post. Often one person winds the warp, while a second person twines the heading cord yarns around each individual warp. Moroccan weavers

sometimes use two rows of twining, as in the first example below.



Ouaouzguite (Glaoua) Weaving. Morocco
4'6" x 4'11" (137 cm x 150 cm). Early 20th century.

STRUCTURES: Weft-faced plain weave, symmetrically-knotted pile, and two-color twining.
YARN SPIN: Z.
WARP: 2-ply grey goathair. 13 per inch (51 per dm).
WEFT: Wool singles. 58 per inch average (229 per dm).
TWINING YARN: 2-ply wool.
PILE: 2-ply wool.
SELVAGES: The construction varies throughout the weaving, but in most areas 4 warp pairs are alternately interlaced individually and in 2 groups by the ground wefts.
LOWER END FINISH: Heading cord made with countered rows of 2-color twining.
[MM-1772. M. Mallett]

Two rows of 2-color twining are countered to make a decorative as well as functional heading cord on this Moroccan weaving. The black and white band above the heading cord is also twined, with the spans and colors offset to create a pointed twill pattern.

A similar heading cord, with two rows of twining was used on a Hamadan area rug [JB-100] that appears on the *Twill Patterns* page.

Bijar Saddle Cover. West Persia
36" x 41" (91.5 cm. x 104 cm.). Late 19th century.

STRUCTURE: Symmetrical knots; H: 12, V: 12, 144 per square inch. (H: 47/dm, V: 47/dm, 2209 per square dm). Discontinuous wefts and weft inlays. Complete warp depression.
YARN SPIN: Z.
WARP: 2-ply ivory/brown wool.
WEFT: Tan wool singles; 2 shots. Sometimes 1 single, other times 2 singles.
PILE: 1 or 2 wool singles; 3 used occasionally.
SELVAGES: Not original.
UPPER END FINISH: Plain weave.
LOWER END FINISH: Plain heading cord; 2-span looped wrapping with 2 pink wool singles (see the *Looped Wrapping* page); plain-weave band.
[AA-70. Allan Arthur]

The heading cord on this saddle cover is a plain one made as in the second drawing above. Directly above it is a row of looped wrapping, an unusual structural detail that is diagramed and discussed on the *Looped Wrapping* page.

West Persian Kilim
4'11" x 10' (232 cm x 473 cm). Late 19th century.

PRIMARY STRUCTURES: Dovetailing (1/1) and slit tapestry (dovetailed field, slit-tapestry borders).
SECONDARY STRUCTURES: Narrow borders of 3-span, 2-color twining with heavy groups of 3-4 wool singles. Soumak wrapping of pattern outlines in the main border.
YARN SPIN: Z.
WARP: 2-ply ivory wool; 7 per inch (28 per dm).
WEFT: 2 wool singles; 20-26 per inch (79-102 per dm).
SELVAGES: 1 pair of warps.
UPPER END FINISH: 1.5 cm-wide obliquely interlaced band. (See the *Obliquely Interlaced Bands* page for a photo.)
LOWER END FINISH: Twined heading cord.
[MM-1825. M. Mallett]

This Persian kilim has the most common kind of twined heading cord. The horizontal ivory yarns are the ends of the warps; several diagonally oriented ivory yarns make up the thick heading cord itself.

The colorful borders above are decorative two- color, two-span twining--"two-span," meaning that each segment encloses two warps. Three or four colored yarn singles are actually used together for each twined element.

Bijar Knotted Pile Rug. Northwestern Persia
3'6" x 7'3" (165 cm x 343 cm)

STRUCTURE: Symmetrical knots, H: 9, V: 8, 72 per square inch (H: 34/dm, V: 32/dm, 1088 per square dm). Complete warp depression.
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFTS: Heavy 2-ply taut ivory wool alternates with 2 sinuous peach wool singles.
SELVAGES: 1 warp pair, overcast with red wool singles. The overcasting interlocks with each taut weft.
LOWER END FINISH: A wrapped heading cord is followed by a row of 4/2 soumak; then a row of looped wrapping crosses half of the rug, with a row of 4/2 soumak on the other half. Next come countered rows of 4-span black and white twining, and two more rows of 4/2 soumak. There are no wefts in the end band, merely one heavy plain-weave pick before the knotting begins. (See the *Looped Wrapping* page.)
[AA-1005. Allan Arthur]

The fraying on this heading cord allows us to see the construction. Three yarns similar to the warps compose the heading cord itself, and these have been wrapped with three more yarns to fill the spaces and make the fabric more compact. This may have been added after the weaving was finished.

The black and ivory yarns are twined; three of the four rows of red wrapping are simple 4/2 soumak, while the red row just beneath the twining is looped wrapping. There are no plain-weave ground wefts separating the soumak or twining, thus this very decorative end finish is stretchy and a bit frail.

(Front and back shown)

Hamadan Rug. Western Central Persia
4'5" x 9'8" (134 cm x 106.5 cm)

STRUCTURE: Symmetrical knots, H: 7.5, V: 8, 60 knots per square inch. (H: 30/dm, V: 32/dm, 960 per square dm.) No warp depression.
YARN SPIN: Z.
WARP: 6-ply white cotton.
WEFT: 2-ply brown wool.
PILE: 2 wool singles.
SELVAGES: Not original.
LOWER END FINISH: Plain heading cord, finished with a blanket stitch (button-hole stitch) in two alternating colors. Balanced plain weave

band, with decorative rows of 2-color, 3-span twining. Countered rows of brown and yellow twining are directly above the heading cord. [AA-109050. Allan Arthur]

A plain heading cord was used at the lower end of this rug, and was followed by two countered rows of brown and yellow twining. After the rug was removed from the loom, alternating brown and yellow blanket stitches were worked through the spaces left by the lashing.

This needle-worked structure is very similar in appearance to the two-color chained selvage shown in Figure 15.64 in *Woven Structures.* That selvage, however, is produced on the loom, as the rug is woven.

Lori Rug. Western Persia
3'5" x 6'6" (102 cm x 195 cm)

STRUCTURE: Symmetrical knots, H: 5, V: 5, 25 per square inch (H: 20/dm, V: 20/dm, 400 per sq. dm). Overlapping knots used profusely along the selvages for additional bulk, also within the field to shape design elements. No warp depression.
YARN SPIN: Z.
WARP: Mixed. Primarily 4-ply cotton, but also 2-ply mixed cotton and wool, 3-ply mixed wool and cotton , 2-ply dark brown wool, 2-ply mixed brown and gray wool, and two-ply blue wool.
WEFT: Mixed. 2 and 3 singles (primarily 2); dark or medium brown, gray, or red wool; also mixed cotton and wool singles. Most often two different colors or shades were used together. Wefts cross between sheds (see detail below).
PILE: 2 wool singles; a few knots of white cotton.
OVERCAST SELVAGES: 2 warp units (2,2) overcast with thick brown wool singles.
LOWER END FINISH: Twined heading cord; balanced plain weave with brown wool wefts.
DESIGN: Dark blue ground; lattice of staggered large diamonds in three columns containing four stylized flowers.
[DD-131. Daniel Deschuyteneer]

A plain twined heading cord began this Lori weaving.

This detail shows not only the erratic mix of warp materials used in the Lori rug, but also a clear example of wefts crossed between sheds. When the wefts were crossed and placed in the second shed, the interlacement sequence was necessarily interrupted; thus the wefts floated diagonally -- one over two warps, the other under two -- as each continued in its original direction. For a discussion of crossed wefts and the reasons for their use, see pages 43-45 in *Woven Structures.*

Senneh Kilim. Western Iran
38½" x 46½" (98 cm x 118 cm)

STRUCTURE: Slit tapestry. Many of the wefts are eccentric.
YARN SPIN: Z.
WARP: 2-ply ivory wool; 13 per inch (51 per dm).
WEFT: 2-ply wool; approximately 80 per inch (315 per dm).
SELVAGES: No special treatment.
LOWER END FINISH: Twined heading cord.
[DM-6006. Darrell Moseley]

In the actual size photo at the left, you can see the Senneh kilim's tiny twined heading cord. This was made in exactly the same way as the heavy heading on the Western Persian kilim above (MM-1825). It is hard to believe that such fine yarns can secure the warp! Four yarns (each the same 2-ply wool as the warps) were combined for each twined element.

In the magnified view below, you can also see a doubled *lease cord* directly above the heading cord. This yarn was inserted in the warp right after it was wound, to maintain the *cross* and keep the yarns in sequence when the warp was moved to the loom. This weaver chose to leave her lease cord as part of the rug, to provide a base against which to begin packing the regular wefts.

Mahal Carpet. Arak area of North Persia
10'4" x 14'4" (310 cm x 440 cm)

STRUCTURE: Asymmetrical knots, open left; H: 6, V: 8, 48 per square inch. (H: 23/dm, V: 32/dm, 640 per square dm.) Moderate warp depression. Discontinuous wefts (lazy lines).
YARN SPIN: Z.
WARP: 6-ply hand-spun cotton.
WEFT: 5-ply hand-spun blue cotton; 2 picks, one sinuous, one taut.
SELVAGES: Three warp units (1,1,1) overcast with blue wool singles.
LOWER END FINISH: Wrapped heading cord; balanced plain- weave cotton band.
[DD-117. Daniel Deschuyteneer]

NOTE: Daniel reports that he has seen this precise kind of heading cord on several

Mahal carpets. He notes also that they have all displayed lazy lines.

The durable plain-weave band at the end of this carpet is a nearly balanced weave--the weft is a pair of heavy, undyed cotton yarns. When the character of the end bands differs from the ground weave in the body of the rug, we should try to remember to note that in our analyses.

The irregularities in the weave here show why other weavers have often used one or more rows of twining at or near the beginnings of their rugs. Twined yarns can secure and space the warps evenly.

The heading cord has been wrapped with an extra cotton yarn--presumably after the rug was removed from the loom--to fill the spaces left when the lashing was removed, and thus make the structure more compact.

Kamereh (Hamaden) Rug
4'4" x 7'1" (205 cm. x 335 cm.). 1880-1900 (?)

STRUCTURE: Symmetrical knots. H: 9, V: 10, 90 per square inch.
YARN SPIN: Z.
WARP: 5-ply cotton, apparently handspun.
WEFT: Loosely twisted 2-ply brown wool; 1 shot.
PILE: 2 wool singles.
SELVAGES: Several warps overcast with dark brown wool.
LOWER END FINISH: Plain heading cord, wrapped with blue and yellow wool yarns.
[MT-47. Mike Tschebull]

NOTE: Mike points out that many older Hamaden rugs--perhaps just antique pieces--have cotton warps and wool wefts, rather than all cotton foundations.

Mehreban Runner
2'9" x 10' (130 cm. x 473 cm.) Circa 1925

STRUCTURE: Symmetrical knots. H: 8, V: 8, 64 knots per square inch.
YARN SPIN: Z.
WARP: 5-ply cotton, apparently machine spun.
WEFT: 2 loosely twisted cotton yarns; 1 shot.
PILE: 2 wool singles.
SELVAGES: Several warps overcast with red wool.
LOWER END FINISH: Heavy cotton heading cord, wrapped with red wool yarn.
[MT-1646. Mike Tschebull]

The colored wool wrapping on this heading cord and the one above serve to fill spaces that were occupied by lashings that held the heading cord to the loom beam. Such wrapping thus makes the lower edge more compact.

Bakhtiari-Lori Bag. Persia
32" x 79" (82 cm x 200 cm). Circa 1890.

STRUCTURE: Double-interlocked tapestry.
STRUCTURE, BACK SIDE: Plain weft-faced weave.
YARN SPIN: Z.
WARP: 2-ply dark brown wool, 10 per inch.
WEFT: Wool, 2 singles, 30 per inch.
SELVAGES: 4 outer warps doubled.
LOWER END FINISH: Plain heavy heading cord; rows of two-color twining.
UPPER END FINISH: Rows of two-color twining and countered two-color twining.

[TKG-120. Daniel Deschuyteneer]

The heading cord used to start this weaving is a plain, heavy one, with no wrapping as on the rugs above. Rows of two-colored twining appear within the plain-weave band above the heading cord.

Here's a good opportunity to see the back side of a typical Bakhtiari tapestry weave with double-interlocking wefts. These interlocks form thick ridges on the back, while the front of the weaving is smooth, with sharp divisions between color areas.

Both the field motif and border on this bag were used by other South Persian weavers, but with slit-tapestry or dovetailed structures.

Hamadan Area Rug. Persia
3'4" x 5'6" (158 cm x 260 cm)

STRUCTURE: H: 6, V: 9, 54 per square inch. (H: 2/dm, V: 35/dm, 840 per square dm.) Discontinuous knotting and discontinuous wefts. No warp depression.
YARN SPIN: Z.
WARP: 5-ply white cotton.
WEFT: 8 white cotton singles; 1 shot.
PILE: 2 wool singles.
SELVAGES: 2 warp units (2,2), overcast with peach-colored wool singles. The overcasting interlocks with the wefts.
LOWER END FINISH: Twined heading cord; 2 cm. white cotton balanced plain-weave band made with 8 cotton singles.
[AA-9746. Allan Arthur]

A twined heading cord appears on this more recent Hamadan-area rug. The plain-weave weft is the same 8 cotton singles that are used in the single-pick ground weave.

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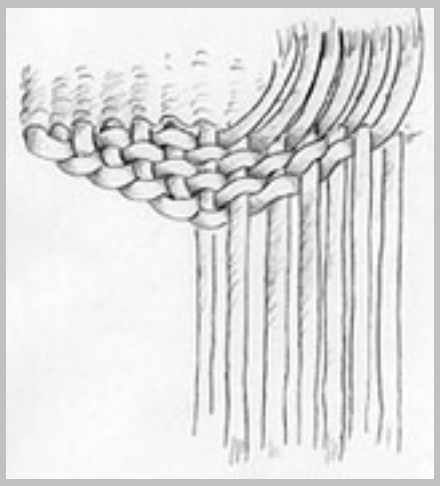
Bands of Oblique Interlacing



Oblique interlacing **has been used for durable end finishes that protect both the warps and wefts. Such a band is finger-woven after a rug is removed from the loom.**

Starting at one side of a rug, the weaver holds a few warps taut and interlaces each warp yarn through them sideways in turn. Instead of working with single yarns, as in the diagram, she may use two or more together as a unit, packing them tightly. With this finish, the loose warp ends can be left where they emerge inward, toward the body of the rug. These may appear on either the front of a rug or the back, depending upon which side was up when the interlacing was done.

At the beginning of an *obliquely-interlaced band,* the first interlaced warp unit lies parallel with the end of the rug. The next warp units begin to slant upward, and soon they are consistently diagonal. The back and front of these bands look about the same: the yarn segments are all neatly aligned, and the outside edge has a trim, braided look. The beginning end of such a band slopes downward, while the other slants outward and may be finished with overhand knots or braids.

To distinguish an obliquely-interlaced band from other types, simply tug at one of the loose projecting warp ends and see what moves within the band. You should be able to follow the path of an individual yarn as it travels diagonally toward the edge, weaving over and under the warps it intersects. It may help to fold the band on a slight diagonal to more clearly expose the interlacing yarns.

West Perisan Kilim
4'11" x 10' (232 cm x 473 cm). Late 19th century.

PRIMARY STRUCTURES: Dovetailing (1/1) and slit tapestry (dovetailed field, slit-tapestry borders).
SECONDARY STRUCTURES: Narrow borders of 3-span, 2-color twining with heavy groups of 3-4 wool singles. Soumak wrapping of pattern outlines in the border.
YARN SPIN: Z.
WARP: 2-ply ivory wool; 7 per inch (28 per dm).
WEFT: 2 wool singles; 20-26 per inch (79-102 per dm).
SELVAGES: 1 pair of warps.
UPPER END FINISH: 1.5 cm-wide obliquely interlaced band.
LOWER END FINISH: Twined heading cord. ***(See Heading Cord page for photo.)***
[MM-1825. M. Mallett]

This obliquely interlaced band is narrow, but sturdy because each pair of warps has been woven sideways through nine warp pairs. The back looks the same, except that it has no emerging warp ends. The edge has a neat 'braided' look. The two-colored borders above are twined with thick groups of wool singles. (Front)

At the end of an obliquely interlaced band, something must be done with the last warp ends. Here they have been braided in four separate groups, then finished with overhand knots. Other times they are made into a single braid or are simply knotted. (Front)

"Kars/Kazak" Knotted-Pile Rug. Northeastern Turkey or South Caucasus
44" x 75" (173 cm x 295 cm).

STRUCTURE: Symmetrical knots. H: 5.5, V: 8, 44 per square inch. (H: 22/dm, V: 32/dm, 704 per square dm.)
No warp depression.
YARN SPIN: Z.
WARP: 3-ply gray wool.
WEFT: 2-ply blue wool; 4 picks, crossed between sheds.
PILE: 2 wool singles.
ATTACHED SELVAGES: 3 warp units (one free-floating [2] and two integral), interlaced in 2 groups by rust, ivory or blue 2-ply wool in sections. The blue ground wefts cross the selvage yarns in some areas.
UPPER END FINISH: Obliquely interlaced band.
LOWER END FINISH: Warp loops.
[AA-3225. Allan Arthur]

Rugs from the northeastern part of Anatolia and the southern Caucasus present many problems of attribution, as do Kurdish rugs from the Caucasus. Structural features like crossed wefts and attached selvages are used in only some production from these

areas and along with specialized end finishes may eventually prove helpful in isolating groups.

3-warp groups interlace here with 4 units. As with the kilim above, this band was worked from the rug's front, and so the warp ends emerge on the front. The end of the band where such interlacing began is always slanted.

West Anatolian Rug.
4'2"x 6'7" (127 cm. x 200 cm.) Second half, 20th century.

STRUCTURE: Symmetrical knots. H: 5.5, V: 7, 38 per square inch (H: 22/dm, V: 28/dm, 618 per square dm). Severe warp depression and ribbed back.
YARN SPIN: Z.
WARP: 3-ply ivory wool.
WEFT: 2 dark brown wool singles; 2 shots.
PILE: 2 thick wool singles; height: 1 cm.
SELVAGES: 1 warp (free floating) and the first pair of integral, knotted warps, are interlaced by red wool singles.
UPPER END FINISH: Plain weave; narrow band of oblique interlacing (with heavy groups of 5-6 warps), finished with a thick, heavy three-strand braid.
LOWER END FINISH: Plain weave; 2/1 soumak; long warp loops. (See the *Warp Loop* page for photo.)
[DD-104. Daniel Deschuyteneer]

Here a narrow band of oblique interlacing has been worked with heavy groups of warps--5 or 6 together. Because each group is woven sideways for a very short distance, only interlacing with two warp groups, this band is not secure. This example is included to show a degenerate form of the construction; older rugs typically display more intricate interlacing. (Front)

The back of the same interlaced finish, with the warps upward, as they emerged after interlacing. This finish was worked from the back.

Interlaced bands this narrow are easily confused with the much more secure half-hitch finishes. See the page on *Half-Hitch Bands* for comparisons.

Meshkin or Ardabil Knotted Pile Carpet. NW Persia
4'4" x 9'5" (205 cm x 445 cm). Circa 1930.

STRUCTURE: Symmetrical knots. H: 4.5, V: 6, 27 per square inch (H: 20/dm, V: 24/dm, 480 per square dm). No warp depression. Stacked knots used for design articulation.
SECONDARY STRUCTURE: 2-color, 2-span twining for narrow borders.
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFT: 2 blue or red wool singles; 2 picks, crossed between sheds.
PILE: 2, 3 or 4 wool singles; primarily 2, but varied to equalize uneven spinning.
SELVAGES, LEFT: 5 warp units, RIGHT: 5 warp

units; reinforced in two groups (3,2 and 2,2) with red wool singles. Incomplete coverage of the blue ground wefts in many places.
LOWER END FINISH: Band of oblique interlacing; 2-color, 2-span twining and plain weave.
[AA-21085. Allan Arthur]

This narrow band of obliquely interlaced warps is secure because its 3-warp groups interlace sideways over and under 5 groups of warps. The fringe emerges on the upper back side of the band.

As in the kilim above, two-color twining has been used decoratively. This red and yellow twined row is edged with two blue plain-weave wefts. The artisan has effectively repeated the red and yellow twining sequence in a narrow pile border.

Malatya Cicim. Eastern Anatolia.
6' x 10'5" (284 cm x 493 cm). 19th century.

PRIMARY STRUCTURES: Overlay-underlay brocade, with 3/1 interlacing predominating; weft-faced plain-weave bands; slit tapestry bands. Woven in two panels.
YARN SPIN: Z.
WARP: 2-ply brown wool; 12 per inch.
GROUND WEFT: Wool singles; 2 picks between rows of brocading.
BROCADING WEFT: 2-ply wool; 19 per vertical inch.
TAPESTRY WEFT: 2 wool singles.
SELVAGES: 1 set of paired warps.
END FINISHES: Obliquely interlaced bands, 3/4" wide. Warp ends are corded, then pairs of cords tied, then cabled, and finally finished with overhand knots.
[MM-1509. M. Mallett]

For this interlaced band, 4-warp groups interlace a long way sideways-- through 12 groups of warps-- making this a very secure band. In this rather elaborate finish, the groups of the short upward-emerging plied warps have been corded, pairs of cords have been tied together, then they have been cabled and finished with overhand knots.

South Persian Moj ('Jajim')
5' x 7'5" (236 cm x 351 cm)

STRUCTURE: Double-interlocked twill tapestry. Woven in two panels.
SECONDARY STRUCTURE: Countered rows of 2-color twining.
YARN SPIN: Z.
WARP: 2-ply wool, in dark blue, rust, ivory, light blue green and gold; 23 warps per inch (91 per dm).
WEFT: 2 wool singles.
SELVAGES: 4-warp unit, overcast by the variously colored wefts.
FINISH ON ONE END: 5/8" band of oblique interlacing.
[AA-3802. Allan Arthur]

On this South Persian *moj*, the variously colored warps make an attractive obliquely-interlaced band. The diagonal path of the interlacing is especially clear here: notice the path taken by the group of yellow-orange warps on the right, for example. Or the red or white warps. The ends all emerge on the back of the weaving. In this piece, 4-warp units interlace with 6 groups of warps.

Kurdish "BabyBag." Van/Hakkari area of SE Anatolia. **36 cm. wide by 38 cm. high, plus 55 cm.-long fringe**

STRUCTURE: Warp-faced plain weave (with vertical, warp-wise stripes).
YARN SPIN: Z.
WARP: 2-ply wool, various colors; 33 per inch.
WEFT: 2-ply gray brown wool; 10 per inch.
SELVAGE: No special treatment.
END FINISH: Band of oblique interlacing. Warp ends corded to make long fringes. At each side, 3 groups of warps are braided together.
[DD-143. Mehmet Kiliç, Tribal Gallery
Analysis: D. Deschuyteneer]

This very trim obliquely interlaced band was made after the woven panel was folded and stitched together to form a triangular shaped bag. Since the band crossed the seam, it strengthened the construction.

Large groups of the two-ply warps were corded to make long fringe, while groups at the sides formed sturdy three-strand braids.

Kurdish Knotted-Pile Rug. NW Persia
3'7" x 5'9" (169 cm x 272 cm)

STRUCTURE: Symmetrical knots. H: 5, V: 7, 35 per square inch. (H: 20/dm, V: 28/dm, 560 per square dm.) No warp depression.
YARN SPIN: Z.
WARP: 2-ply tan wool.
WEFT: 4 tan/gray wool singles; 1 shot.
PILE: 2 wool singles.
SELVAGES: 2 warp units (2,2), overcast with light brown wool singles.
UPPER END FINISH: Thin and flat 1.5 cm obliquely interlaced band. 3-span, 2-color twining decorates a brown, balanced plain-weave band.
LOWER END FINISH: Twined heading cord. 3-span, 2-color twining decorates a brown, balanced plain-weave band.
[AA-9744. Allan Arthur]

Although this is a coarsely knotted rug, the obliquely interlaced band is very refined. It is a thin, flat and superbly constructed finish. Pairs of warps interlace with 12 warp units.

A balanced, plain-weave band above the warp end finish is decorated with 3-span twining.

"Kars/Kazak" Knotted-Pile Rug. Northeastern Turkey or Southern Caucasus
4'5" x 6'6" (209 cm x 307cm)

STRUCTURE: Symmetrical knots. H:6, V: 8, 48 knots per square inch. (H: 24/dm, V:32/dm, 768 per square dm.) No warp depression.
YARN SPIN: Z.
WARP: 4-ply gray wool.
WEFT: 2-ply rust wool; 2, 3 or 4 picks; crossed between sheds, sometimes crossing the rows of knots.
PILE: 2 wool singles.
ATTACHED SELVAGES: 4 warp units, 2-free-floating units (2,2), and 2 integral units (1,1), interlaced by variously colored 2-ply wool yarns in 3 pairs.
UPPER END FINISH: 1.5 cm obliquely interlaced band.
LOWER END FINISH: 1½" warp loops.
[AA-10-1053. Allan Arthur]

3-warp groups interlace sideways with 5 units to make this band, emerging on the rug's front.

Beyond its warp and weft materials, the combination of several features in a rug like this are notable: its interlaced band, warp loops, crossed wefts, and attached selvages. AA-3325, toward the top of this page, shares these structural features.

Malayer Knotted Pile Carpet. Iran
51" x 82" (129.5 cm x 208 cm)

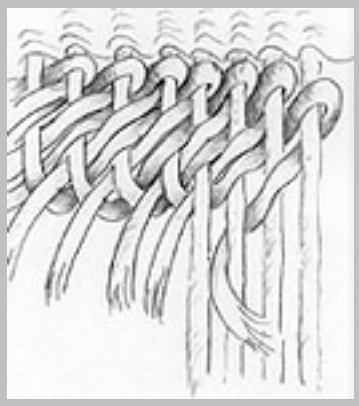
STRUCTURE: Symmetrical knots. H: 8, V: 9, 72 per square inch. (H: 32/dm, V: 35/dm, 1120 per square dm). Lavish use of weft inlays. No warp depression.
SECONDARY STRUCTURE: 2-color, 3-span twining in several rows.
YARN SPIN: Z.
WARP: 6-ply white cotton.
WEFT: multi-ply cotton; 1 shot.
PILE: 2 wool singles.
SELVAGES: 3 warp units (2,3,1), overcast with lavender wool singles.
UPPER END FINISH: ½" obliquely interlaced band.
LOWER END FINISH: Twined heading cord. (See the *Twining* page for another photo.)
[KK-25745. Ken Kashani]

Here pairs of thin cotton warps interlace sideways through 7 warp units, making a very tight, small band. These warps lie in nearly horizontal positions. The ends emerge inward on the back, where they have been left about ¼ inch long. The starting point on such a band is always slanted or curved.

Back to End Finishes page

How to participate in this project

Bands of Two-Pick Oblique Interlacing



The bands on this page represent an elaboration on simple oblique interlacing. The technique's increased complexity allows the warp ends to emerge at a band's outer edge, away from the rug. As with simple interlacing, a few warps are held downward while each warp or warp group is interlaced at an angle upward toward the fabric. But it then reverses to weave downward. In other words, two oblique picks ('wefts') are interlaced with each warp unit.

With a *two-pick interlaced band,* whenever a new warp yarn (or unit) begins weaving upward, it follows the exact path taken by the last yarn on its downward movement. When these yarns are packed together, they combine to make thick, oval-shaped segments. Because two yarn units always lie together and both edges are bound, the weaver can trim the emerging warp ends if she wishes. Like the simpler interlaced constructions, this band looks the same on its front and back.

Occasionally, the downward interlacing stops somewhere in the center of the band. We can describe these examples as partial two-pick interlacing.

To identify any of these interlaced bands for certain, and separate them from other constructions, try folding them diagonally. You should then be able to follow the path of the interlacing. For now, I think we should carefully distinguish between single and two-pick bands, as the techniques vary significantly. Only after we have done so with a considerable number of weavings will we know if the differences have diagnostic value.

Gaziantep/Malatya Area Rug. Southeastern Anatolia
47" x 79" (120 cm x 200 cm). First quarter, 20th century

STRUCTURE: Symmetrical knots, H: 7.5, V: 11, 82 per square inch. (H: 30/dm, V: 43/dm, 1290 per square dm).
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFT: Aubergine/brown wool single, 2-4 shots.
PILE: 1 or 2 wool singles; 2-ply white wool; height: 7 mm.
SELVAGES: 4 warps, reinforced in pairs with variously colored wool singles.
EACH END FINISH: Band of two-pick oblique interlacing; weft-faced plain weave.
[DD-105. Daniel Deschuyteneer]

As with single-pick oblique interlacing, both sides of this 2-pick band look about the same: thick oval segments are formed of yarns interlacing in opposite directions.

Herki Kurd Kilim. Hakkari area, Southeastern Anatolia
5'4" x 7'2" (163 cm x 218 cm). 20th century

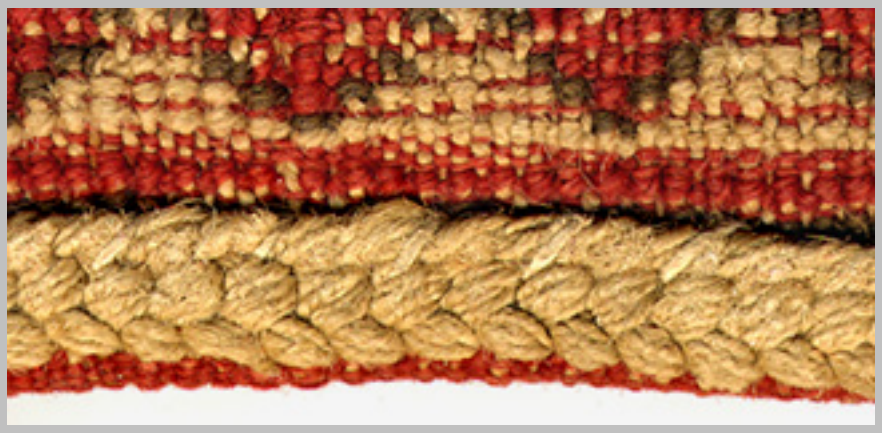
STRUCTURES: Slit tapestry; soumak wrapping used for design outlines. Woven in two panels.
YARN SPIN: Z.
WARP: 2-ply ivory/tan wool, 9 per inch (35 per dm).
WEFTS: 2-ply wool; metallic-wrapped cotton; 44 per inch (173 per dm). Wool singles in the end borders.
WARP-END FINISHES: 2.5 cm-wide bands of 2-pick oblique interlacing. The fringe was corded originally.
[MM-1045. M. Mallett]

Two-pick oblique interlacing has been used for very firm warp-end finishes on a great many SE Anatolian Kurdish kilims. Here, the downward interlacing warp ends emerge on the front of the kilim, and the back (shown below) has a slightly more "finished" look. Even after the fringe yarns have worn away, this band will remain as a secure finish. (Front)

Just as with single-pick interlacing, these bands are curved or slanted at their starting points. When the panels of a two-part Herke Kurd kilim are assembled, the weavers typically put the two curved ends together at the center seam. (Back)

Kazak "Karachov" Knotted Pile Rug. South Caucasus
6' x 8'10" (175 cm x 265 cm).

STRUCTURE: Symmetrical knots, H:7, V: 7, 49 per square inch (H: 28/dm, V: 29/dm, 812 per square dm.) Knots offset to better articulate diagonals in the design; knots overlapped, both to make transitions and to increase bulk near the sides. Stacked knots used in the design (see examples in the photo below). No warp depression.
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFT: 2 red wool singles; 3 to 6 picks, crossed between sheds, occasionally jumping over rows of knots.
PILE: 2 wool singles.
SELVAGES: Four warp units (1,1,1,1), reinforced in pairs with wool singles (varying color bands, and uneven coverage of the ground wefts).
UPPER END FINISH: Band of two-pick oblique interlacing; currently turned under and sewn down.
[DD-129. Daniel Deschuyteneer]



This two-pick band has been turned under and sewn down, although this seems not to be its original position. The stitching was done with machine-spun cotton thread. The heavily abraded warp ends are no longer visible. (Back view)

Stacked knots can be seen in a couple of places in this photo. At the downward- pointing tip of each red triangle, brown and ivory knots have been tied in the space usually allotted one knot. (The ground wefts in this rug are red.)

Northwest Persian Knotted Pile Carpet
4'4" x 10'10" (132 cm x 330 cm)

STRUCTURE: Symmetrical knots, H: 6, V: 8, 48 per square inch (H: 24/dm, V: 32/dm, 768 per square dm). Warp depression varies from moderate to none.
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFT: Primarily wool singles, in some areas 2 wool singles; brown, pink, tan or gray; 2 picks, crossed between sheds.
PILE: 2 wool singles.
SELVAGES: 4 warps, reinforced in 2 groups (2,2) by multicolored 2-ply wool. The reinforcement occasionally also interlaces one pair of warps within the knotted field.
UPPER END FINISH: Very sturdy 1 1/8" (3 cm) 2-pick obliquely interlaced band.
LOWER END FINISH: Short warp loops. See the *Warp Loop* page for photo.
[AA-3224. Allan Arthur]

This wide 2-pick obliquely interlaced band is extremely solid and heavy-- definitely a durable construction. Only fuzzy ends of the warps project along the outside front edge.

Northeast Anatolian Rug. ("Kars Kazak")
3'6"x 5'9" (107 cm. x 175 cm.) 2nd quarter, 20th century.

STRUCTURE: Symmetrical knots, H: 6.5, V: 6, 39 per square inch. (H: 26.5/dm, V: 23.5/dm, 623 per square dm.) No warp depression.
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFT: 2-ply grey/brown wool, red toward the top end; 4-5 picks, crossed between sheds and occasionally over knotted rows.
PILE: 2 wool singles. Contrasting colors are knotted together in some areas.
SELVAGES: 3 warp units; the brown wool weft yarn alternately interlaces and overcasts.
UPPER END FINISH: Plain weave; narrow band of 2-pick oblique interlacing.
LOWER END FINISH: Plain weave; 1.5 cm. warp loops.
[AA-3056. Allan Arthur]

You can perhaps see here that only 3 warps make the turn (at the left) to weave upward together, while in the thick oval segments there are twice that number of yarns packed together. The upward and downward interlacing portions have combined.

Note the very similar band on a much earlier Karachop Kazak rug above (DD-129)

Heriz Knotted Pile Rug. Iran
3'7" x 10'6" (169 cm x 496 cm). Circa 1900.

STRUCTURE: Symmetrical knots, H: 6, V: 8, 48 per square inch. Slightly depressed warp.
YARN SPIN: Z.
WARP: 4-ply cotton.
WEFT: Undyed cotton bottom half, beige wool top half; 2 to 4 shots between knotted rows.
PILE: Wool. 10 mm long.
ATTACHED SELVAGES: Two pairs of warps (1 pair free- floating), interlaced with multicolored wool singles.
UPPER END FINISH: Two-pick obliquely interlaced band. (Similar to the examples above.)
LOWER END FINISH: Warp loops.
[MT-100. Mike Tschebull]

According to Mike, " This is a typical set of end finishes for a Transcaucasian rug, but not at all for a Heriz-type export rug. The pattern is also atypical for export, and it is something one usually only sees in Transcaucasian rugs. The format is also atypical. I'm guessing that this rug was woven in about 1900 or before, at the very beginning of export demand in rural Azarbayjan, and has finishes you might have seen on some domestic market-intended rugs." This interesting rug has prompted some discussion, with other people wondering if it might be from farther south.

Lambalo Kazak Pile Rug
4.6" x 6'6" (140 cm x 210 cm). 1948

STRUCTURE: Symmetrical knots, 56 per square inch.
No warp depression.
WARP: 2-ply ivory wool.
WEFT: Redish wool singles, 2 or 3 picks.
SELVAGES: 2 warp units (2,2) reinforced with short lengths of 2-ply wool (of various colors) that also encircle one pair of warps in the knotted-pile section. Ends of these multicolored wool yarns were left free hanging to form decorative fringe along the sides.
LOWER END FINISH: Warp loops.
UPPER END FINISH: Band of two-pick oblique interlacing.
[FB-100. Filiberto Boncompagni]

Filiberto believes that the date on this rug has been altered-- changed from 1948 to 1918.

The obliquely interlaced band on this rug is similar to those above. A much more unusual feature is the multicolored fringe on the sides made with selvage reinforcing yarns. Each of these separate weft lengths must make at least four passes so that the outermost warp is enclosed. A similar feature appears on Uzbek and Kyrgyz weavings, where fringed bands made with cards or finger looping are attached.

Herke (?) Kurd Kilim. Iraq
2.6" x 7' (118 cm x 331 cm). Early 20th century.

PRIMARY STRUCTURE: Slit tapestry.
SECONDARY STRUCTURE: Small motifs in overlay/ underlay brocading.
YARN SPIN: Z.
WARP: 2-ply ivory wool; 12 per inch (47 per dm).
WEFT: Wool singles; average 46 per inch (181 per dm).
SELVAGES: 2 pairs of warps.
WARP END FINISHES: 1.3 cm-wide band of 2-pick oblique interlacing; 8-strand square braids, joined in pairs.
[MM-1037. M. Mallett]

6-warp units interlace only a short distance in this end finish, and then reverse to weave downward. Because adjacent warp units lie together, they make thick oval bulges--each with 12 warps! Eight groups of these warp units have then been corded and combined in 8-strand square braids. Finally, these were bound together in pairs. A nearly indestructible warp-end finish is the result.

Anatolian Cicim
52" x 67" (132 cm x 170 cm).

STRUCTURE: Overlay-underlay brocading, 3/3 and 3/1 sequences predominate. Balanced ground weave.
SECONDARY STRUCTURE: All horizontal borders are 3-span twining.
YARN SPIN: Z.
WARP: 2-ply brown wool; 17 per inch (67 per dm).
GROUND WEFT: 2 brown wool singles.
BROCADING WEFT: 3 wool singles; 14 per inch (55 per dm).
SELVAGES: 2 sets of paired warps.
ADDITIONS: Small variously colored tassels remain along one selvage.
FINISH ON ONE END: Obliquely interlaced band, with partial 2-pick interlacing.
[PT-100.]

For this band, the weaver interlaced 6-warp units upward through 6 warp groups, then reversed and turned the yarns downward through just a couple of warp groups. The yarn ends thus emerge in the center of the band on the back side.

The front has a compact, but somewhat irregular look; the interlacing is more difficult to follow than in most bands. Because it is thinner at the outside edge, this band seems to bulge slightly in the middle.

(Front above; back side below)

Malatya/Sinan Saddlebag Face. Eastern Anatolia
26"x 25" (102 cm x 98.5 cm)

STRUCTURE: Slit tapestry.
SECONDARY STRUCTURE: Narrow borders of soumak, the two colors alternated intermittently on some rows.
YARN SPIN: Z.
WARP: 2-ply ivory wool; 14 per inch.
WEFT: 2-ply wool (very high luster); multi-ply white cotton; multi-ply white cotton wrapped with metallic; 2-ply silk floss; average of 58 per inch.
SELVAGES: No special treatment.
END FINISH: Two-pick interlaced band, worked with 3-warp units.
[MM-992. M. Mallett]

A narrow 2-pick band finishes the end of this saddlebag face. On some Sinan examples, the warp ends have then been braided and sewn to the inside of the pouches. For an example, see Figure 17.7 of *Woven Structures*.

All late 19th century and early 20th century Malatya/Sinan saddlebags that I have seen have had similar finishes. An older piece, probably early or mid-19th century, in the Tokyo collection of Junko and Akira Ito, has a finely worked obliquely-wrapped band. Yet there is little doubt that the two weavings are from the same area. See the *Obliquely Wrapped Bands* page.

Kagizman Yolluck. NE Anatolia
2'6"x 9'8" (118 cm x 457 cm)

STRUCTURE: Overlay-underlay brocading (3-span) on a weft-faced ground. Soumak used for horizontal design elements.
YARN SPIN: Z.
WARP: 2-ply brown/tan wool; 15 per inch (59 per dm).
GROUND WEFT: wool singles, 2 picks between brocade rows.
BROCADING WEFTS: 2-ply wool.
SELVAGES: 4 warps, reinforced in 2 pairs with 2-ply wool.
END FINISHES: 2-pick obliquely interlaced bands.
[MM-1805. M. Mallett]

Sivas Yatak. Eastern Anatolia
5' x 5'4" (150 cm x 160 cm)

STRUCTURE: Symmetrical knots, H: 6, V: 7, 42 per square inch (H: 24/dm, V: 28/dm, 672 per square dm). No warp depression.
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFT: Dark brown wool singles; 4 picks between knotted rows (occasionally 3), crossed between sheds.

PILE: Wool, 2 singles, 2 to 4 inches long.
ATTACHED SELVAGES: Irregular, but up to 10 warps are incorporated, most often interlaced by the ground weave in a 2,2,2,1,1,1,1 sequence. 2-ply wool (sometimes contrasting colors plied) interlaces warp pairs, and extends varying distances into the ground, forming wedge shapes (see below); the ground wefts, in turn, extend varying distances toward the edge, only occasionally interlacing all of the warps. The intervening knotting includes stacked, overlapped and offset knots used to build bulk in the border area.
END FINISH, Top: 5" weft-faced plain weave skirt with narrow pick-and-pick bands of red wool and white cotton, and one worn band of overlay-underlay brocading; then a band of two-pick oblique interlacing. The lower end finish is the same, but partially missing.
HANDLE: Very heavy and floppy.
[TKG-114. Mehmet Kiliç, Tribal Kilim Gallery
Analysis: Daniel Deschuyteneer]

To produce the small red and white bands in this rug's skirt, the weaver simply alternated wefts of the different colors, to form tiny vertical columns. The name, "pic-and-pic" simply means a pic

(weft) of one color, then a pic of another.

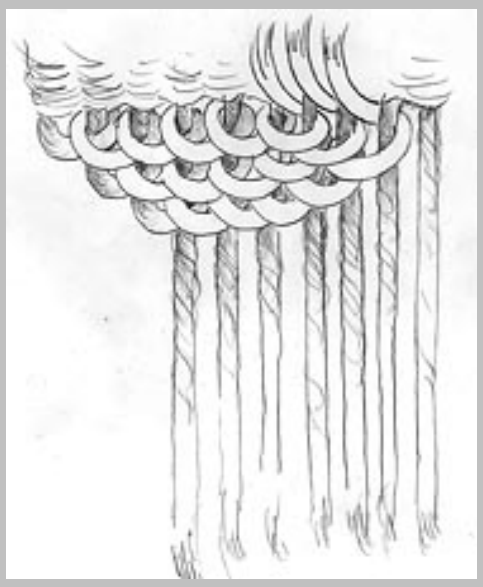
Only fragments of brocading remain, as floats on the surface were more easily abraided.

The two-pic interlaced band has raveled a bit, allowing us to see its construction more clearly. Three warps were used together as a working unit, and two of these pics combine to form fat units of six yarns.

Heavy, plied selvage wefts interlace the warps in pairs on this rug, extending various distances into the ground weave to produce a substantial and durable edge.

End Finishes Project *Woven Structures Update* *HOME*

Bands of Oblique Wrapping



To make a cross-wise band with warp ends, the weaver may turn them, either one by one or in small groups, and wrap them obliquely around a few warps that she holds downward. The construction is much like *weftless soumak*, except, of course, that the warps themselves become the wrapping elements. Most often two or more warp yarns work together as units, not singly, as shown in the diagram. This is all done, of course, after the rug has been taken from the loom.

The first row or two of wrapping are horizontal; then subsequent rows slant upward toward the rug. The ends of the wrapping yarns emerge when they reach the woven fabric. As with *oblique interlacing*, the band is sloped or curved at its starting point.

The best clue to the identification of an *obliquely wrapped band* is the striking difference between its front and back surfaces. Like soumak, one face has long diagonal wrapping spans, while the other has short horizontal spans that form tight, round columns. The warp ends emerge toward the fabric. Either face may be used for the front, and such a band may be worked on either face. It may be worked with either the long spans on top (as in the drawing), or with those spans underneath.

Kars Kilim. Northeast Anatolia
5'4" x 13'5" (163 cm x 410 cm). 2nd quarter, 20th century.

STRUCTURES: Slit tapestry. Sparse twining and soumak details.
YARN SPIN: Z.
WARP: 2-ply wool, in ivory and various shades of brown, some plied barber-pole fashion. 8 per inch (32 per dm).
WEFT: 2-ply wool, 36 per inch (142 per dm).
SELVAGES: One set of paired warps.
ATTACHMENTS: Remnants of tassels remain that were attached through slits along the sides.
END FINISHES: Bands of oblique wrapping. Corded warp fringe (retained in a few places).
FURTHER NOTES: A long tab made with a slit measuring 16" (40 cm) runs along each side of the kilim at one end. The purpose of these is unknown.
[DD-101. Daniel Deschuyteneer]

The wrapped band on this kilim has been worked so that the face normally considered the back is used instead for the front. Changes in the color of the warps show up as diagonally-shaped sections in the band, since their wrapping path is oblique.

Back of the kilim. These warp ends finished their wrapping in an upward position. When the kilim is in use, this fringe flops downward, behind the band.

East Anatolian Rug
4'7" x 12'8" (140 cm x 386 cm). Circa 1900.

STRUCTURE: Symmetrical knots; H: 7, V: 7, 49 knots per square inch (H: 27.5/dm, V: 27.5/dm, 756 knots per square dm). Discontinuous wefts and weft inlays. No warp depression.
YARN SPIN: Z.
WARP: Loose 3-ply yarns: 2 tan wool plies and 1 dark brown goat hair ply.
WEFT: 2-ply light brown wool; primarily 2 picks, crossed between sheds.
PILE: 2 wool singles; 2 camel-hair singles; height: 6 mm.
SELVAGES: Not original.
UPPER END FINISH: Plain weave; band of oblique wrapping.
[DD-102. Daniel Deschuyteneer]

Variously colored plies in the warps of this rug obscure the fine structure of the oblique wrapping. (Front)

Veramin Kilim. Persia
3'2" x 8'10" (150 cm x 418 cm). 20th century.

PRIMARY STRUCTURE: Slit tapestry. Interlaced pattern outlining and other eccentric wefts.
SECONDARY STRUCTURE: Heavy borders of 3-span twining.
YARN SPIN: Z.
WARP: 7-ply white cotton; 7 per inch (28 per dm).
WEFT: 2-ply wool; 38 per inch (150 per dm) average.
UPPER END FINISH: Overhand knots.
LOWER END FINISH: Narrow band of oblique wrapping.
[MM-1055. M. Mallett]

White cotton warps were wrapped obliquely to make a narrow, tight band on this Persian kilim. The cotton has matted, obscuring the structure slightly.

This kilim is completely reversible, so either side might be considered the front. Just above the end finish are two very heavy rows of twining; the ends of these twining yarns are knotted and left as small tassels at the corners.

Kurdish Rug. West Persia
45"x 93" (177 cm x 366 cm)

STRUCTURE: Symmetrical knots, H: 7, V: 11, 77 knots per square inch. No warp depression.
YARN SPIN: Z.
WARP: 2-ply light tan wool.
WEFT: 2 red wool singles, 2 shots.
PILE: 2 wool singles.
SELVAGES: Overcast with red wool.
UPPER END FINISH: Obliquely wrapped band; warp ends finished on the underside with two rows of overhand knots, offset. Balanced plain weave with 2-color, 3-span twining.
LOWER END FINISH: Twined heading cord, followed by 3-strand twining. Plain-weave band with 2-color, 3-span twining. See photo on the *Twining* page.
[MU-100. Mesut Ulusoy]

Pairs of warps have been wrapped obliquely to form an upper end finish for this Kurdish rug. This curved end was the starting point. Front view.

With part of the band folded upward, the differences between its front and back are clearly visible. We can also see part of the knotted warp ends. A photo of the back side appears on the *Knotted Meshwork* page.

Northeast Anatolian Kilim
4'6" x 13' (213 cm x 615 cm)

STRUCTURE: Slit tapestry, with brocaded details.
YARN SPIN: Z.
WARP: 2-ply brown wool; 9 per inch.
TAPESTRY WEFT: 3-ply wool; 44 per inch.
BROCADING WEFT: 3 wool singles.
END FINISHES: Narrow obliquely wrapped bands, worked with heavy groups of 5 warps which are then corded to make long fringe finished with overhand knots. Tightly wrapped columns are formed on the front.
[MM-492. M. Mallett]

This wrapped end finish was worked from the kilim's back side, so that diagonal columns were formed on the front. Because five warps were combined for each wrapping unit, the band is a bit loose and stretchy. The heavy corded fringe has proved very durable. (Front view)

Kurdish Brocaded Panel. Possibly the Aleppo area
35½" x 121" (90 cm x 307 cm)

STRUCTURE: Six warp-faced, brocaded panels, sewn together.
YARN SPIN: Z.
WARP: 2-ply wool or 3-dply hand-spun cotton; 42 per inch.
WEFT: 2-sply wool or 3-ply cotton; 15 per inch.
BROCADE YARNS: Same.
SELVAGES: No special treatment.
END FINISHES: Obliquely wrapped bands. Wrapped columns formed on the front.
[DD-145. Daniel Deschuyteneer]

NOTE: Unlike most multi-paneled brocaded pieces from the Sivas area of Anatolia, this piece is warp-faced.

Front of the band. As with the kilim above, this wrapped band was worked from the back (below) so that tight diagonal columns appear on the front. The ivory wrapping in the detail here extends diagonally across the seam, since the panels were sewn together before the band was made.

Back of the band. The wrapping was done with heavy groups of warps.

Malatya/Sinan Saddlebag Face. Eastern Anatolia
25"x 23" (99 cm x 91 cm)

STRUCTURE: Slit tapestry.
SECONDARY STRUCTURE: Narrow borders of soumak wrapping.
YARN SPIN: Z.
WARP: 2-ply wool; 16 per inch.
WEFT: Wool and cotton; 62 per inch.
TAPESTRY WEFTS: 2-ply wool; cotton.
SELVAGES: No special treatment.
END FINISH: Band of oblique wrapping; diagonal wrapped columns on the back side.
[JI-756. Junko and Akira Ito]

It is surprising to find an obliquely wrapped band on this early saddlebag face, since later examples from the same area display narrow two-pick interlaced bands instead. There is continuity, however, in the design elements used, as well as the unusual soumak details. This slit-tapestry piece is very finely woven and my guess is that it dates from the mid-19th century or earlier.

A later Malatya/Sinan piece is shown on the *Two-Pick Interlaced Bands* page.

Malayer Knotted Pile Carpet. Iran
3'6"x 16'3" (165 cm x 768 cm)

STRUCTURE: Symmetrical knots. H: 8, V: 9, 72 per square inch (H: 32/dm, V: 35/dm, 1120 per square dm) No warp depression.
YARN SPIN: Z.
WARP: 6-ply white cotton.
WEFT: 1 pink wool single; 1 shot.
PILE: 2 wool singles.
SELVAGES: Not original.
UPPER END FINISH: Plain weave; 2 cotton singles.
LOWER END FINISH: 1.5 cm obliquely wrapped band; ends emerge on the back side; Balanced plain weave band, 2 wool singles, supplemented with with borders of red and blue 2-span twining.
[JO-100. John Overton]

Wrapped columns appear on the back of this obliquely wrapped band.

Variations on Oblique Wrapping

In a distinctive variation on oblique wrapping, triangular bases are made for heavy square braids. In separate sections, two pairs of warps are wrapped inward toward a center point, where they turn downward, to be enclosed by the next wrappings. Successive pairs wrap for shorter distances, stopping at the same center; then the warps are combined in a heavy square braid. Carefully distinguishing between obliquely-wrapped end finishes and those made with interlaced details may help to separate groups of Kurdish weaves.

Herke Kurd Kilim. Southeastern Anatolia
36½" x 82" (93 cm x 209 cm)

STRUCTURE: Slit tapestry.
SECONDARY STRUCTURE: Soumak wrapping (2/1) for pattern outlines and narrow borders.
YARN SPIN: Z.
WARP: 2-ply ivory wool; 9 warps per inch (35 per dm).
WEFT: 2-ply wool in the tapestry pattern areas, 42 per inch (165 per dm); wool singles in the plain-weave bands, 30 per inch (118 per dm).
SELVAGES: 2 sets of paired warps.
END FINISHES: Heavy square braids with triangular wrapped bases.
[MM-105. M. Mallett]

**Five warp pairs are wrapped from each side toward a center,
then four pairs, then three, etc. to form a triangular base for
each heavy square braid. The braids are bound on the ends
with variously colored wools. (Front)**

The backs of the triangular bases display the vertical columns typical of wrapped structures.

Yezidi Kurd Rug, NE Iraq
27½" x 51" (108 cm. x 202 cm.) Circa 1930.

STRUCTURE: Symmetrical knots. H: 6, V: 6, 36 per square inch. (H: 24/dm, V: 24/dm, 576 per square dm). Some discontinuous wefts. Offset knots used to shape the design. No warp depression.
YARN SPIN: Z.
WARP: 2-ply gray wool.
WEFT: Dark gray-brown wool singles, 4 picks.
PILE: 2 wool singles.
SELVAGES: Large and flat (18mm), with 6 warp units (2,2,1,1,1,1) interlaced by the ground wefts and reinforced with contrasting wool singles, forming narrow wedge-shaped bands.
END FINISHES: 2-inch wide weft-faced kilim skirt, adorned with two-color twining. Corded fringes with triangular wrapped bases, finished with overhand knots.
HANDLE: Floppy and heavy.
NOTE: The iconography suggests a Yezidi Kurd origin.
[TKG-110. Mehmet Kiliç, Tribal Kilim Gallery
Analysis: Daniel Deschuyteneer]

Oblique wrapping forms triangular bases for corded fringes.

At the bottom left corner of this Kurdish rug, a 5½" vertical slit is present. The inner part of this slit has its own reinforced selvage. The purpose of this small flap is unknown, but similar flaps occur on the kilim at the top of this page.

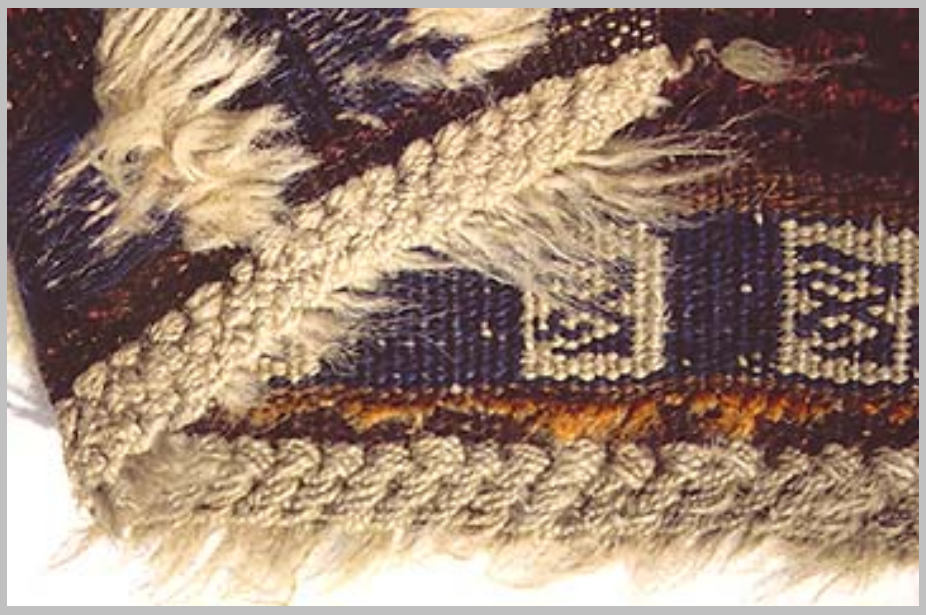
Bands of Oblique Wrapping with Downward Interlacing

Occasionally we see bands of oblique wrapping in which the warp yarns have been *wrapped* sideways and upward toward the rug, then reversed to *interlace* downward. With the warp ends thus encased within the compact structure, they can be trimmed, if the weaver wishes. Otherwise, they can be left emerging downward as fringe.

In this drawing the interlacing yarn splits warp groups, as occurs in the Baluch rug [DD-107] and Kurdish rug [AA-73938] below. In the NW Persian rug [DD-103] they instead interlace with the wrapped warp pairs.

Baluch Knotted Pile Rug. Southwestern Afghanistan or Seistan region of Iran.
41" x 49" (105 cm x 125 cm). Circa 1950.

STRUCTURE: Asymmetrical knots, open left; H: 7, V: 11, 77 per square inch (H: 28/dm, 43/dm, 1161 per square dm). No warp depression.
SECONDARY STRUCTURES: Wide weft-substitution borders patterned with blue and ivory squares; narrow two-color wrapped and bound borders.
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFT: 2 wool singles; 2 shots.
PILE: 2-ply wool.
SELVAGES: Right side, 4 warp units (1,1,1,1, the outside two units corded), double looped in pairs with brown-black goat hair. Left side, 2 cords only.
UPPER END FINISH: Band of oblique wrapping; the warp ends wrap upward, then interlace downward.
LOWER END FINISH: Long (3½") warp loops; pairs of loops have re-plied. A row of twining, then two heavy wefts start the weave.
[DD-107. Daniel Deschuyteneer]



To identify this warp-end finish for certain, it is wise to probe with a needle. The wrapping produces longer spans on the front, with shorter, more rounded segments on the back, but the downward interlacing in between prevents the formation of the neat columns we see on the backs of simple wrapped bands.

Kurdish Rug. Probably Western Iran
4'5" x 8' (135 cm x 244 cm). Circa 1900.

STRUCTURE: Symmetrical knotting; H: 6.5, V: 7, 45 knots per square inch (H: 25/dm, V: 27/dm, 675 knots per sq. dm. Extensive use of offset knotting: all of the field, with the exception of small stepped diamonds along the center axis.
No warp depression.
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFT: 2-ply ivory wool; 1 shot.
PILE: 2 wool singles.
OVERCAST SELVAGES: Now has new overcasting.
LOWER END FINISH: Twined heading cord; three rows of 3-span twining.
UPPER END FINISH: Band of oblique wrapping. The warp ends reverse to interlace downward, splitting the wrapped pairs.
[AA-73938. Alan Arthur]

Such pieces are sometimes attributed to southeastern Turkey, but the overcast selvages and single wefts make that doubtful in this case. The same design of offset knotting may have been used by more than one group, and with differing structural characteristics.

Here again, on the back side of the wrapped band (above) the usual columns are slightly obscured by the downward-interlaced warp ends. We can see a few of the cut ends along the edge.

This rug fortunately retained the end finishes on both ends. Here is the neat twined heading cord from the bottom end, with three rows of 3-span twining just above it--first red and green, then ivory, then dark blue.

Northwest Persian Rug
49" x 83½" (124 cm. x 212 cm.). Circa 1950.

PRIMARY STRUCTURE: Symmetrical knots, H: 4.5, V: 7, 31.5 knots per square inch. (H: 18/dm, V: 28/dm, 504 per square dm). No warp depression.
SECONDARY STRUCTURES: Complementary-weft weave bands (in X and rosette motif) in red and blue, or brown and blue wool singles. Single and triple rows of 2-span black goathair twining edge and separate the pattern bands; white cotton is also twined with the goat hair for accents. (See photos on the *Complementary- Weft Bands* page.)
YARN SPIN: Z.
WARP: 3-ply undyed cotton.
WEFT: 2 picks of thick light blue cotton; in some areas, two-ply brown wool alternates with cotton. Wefts cross between

sheds.
PILE: 2 thick wool singles; height: 1 cm.
SELVAGES: 2 warp units (1,1) interlaced by the ground wefts. Remnants of variously colored wool singles can be seen in the area under later overcasting.
UPPER END FINISH: Oblique wrapping with the ends interlaced downward.
LOWER END FINISH: Twined cotton heading cord.
[DD-103. Daniel Deschuyteneer]

Each group of cotton warps was wrapped sideways (upward) on this rug, then turned and interlaced downward. The back side displays slightly irregular wrapped vertical columns.

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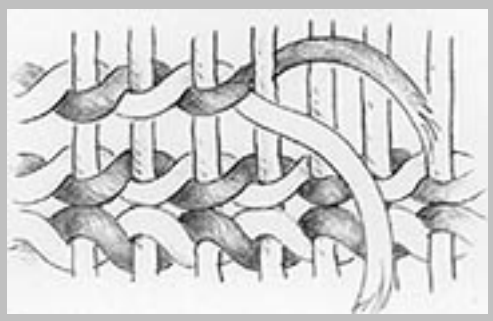
How to participate in this project

Twining

One of the most ancient and basic of all fiber constructions, *twining* has served both utilitarian and decorative purposes. On a separate page we have seen twining used for heading cords. Twining has also frequently been used to space and secure the warp at the beginning of a rug, providing a sturdy base against which to pack plain-weave wefts. Other times it has been used simply for narrow decorative borders.



No shed is opened on the loom for twining. The weaver simply encloses a warp with two yarns, gives them a twist, then encloses the next warp and twists again. She may instead enclose two, three or even more warps between twists. We describe this as '2-span' or '3-span' twining.

If the artisan reverses the direction of twist in successive rows, the twining is said to be 'countered'--as in the lower two rows of the drawing. This is especially effective when two colors are contrasted. Twining always looks the same on the front and back of the weaving. In this respect it differs from soumak, which has short spans on the back, and longer spans on the front.

Twined details are common on rugs from many areas, and have been combined with a wide variety of structures. We will include distinctive examples here.

Malayer Knotted Pile Carpet. Iran
51" x 82" (129.5 cm x 208 cm)

STRUCTURE: Symmetrical knots; H: 8, V: 9, 72 per square inch. (H: 32/dm, V: 35/dm, 1120 per square dm). Lavish use of weft inlays. No warp depression.
SECONDARY STRUCTURE: 2-color, 3-span twining in several rows.
YARN SPIN: Z.
WARP: 6-ply white cotton.
WEFT: multi-ply cotton; 1 shot.
PILE: 2 wool singles.
SELVAGES: 3 warp units (2,3,1), overcast with lavender wool singles.
UPPER END FINISH: ½" obliquely interlaced band. (See photo on the *Obliquely Interlaced Bands* page.)
LOWER END FINISH: Twined heading cord.
[KK-25745. Ken Kashani]

Above the fine twined heading cord on this rug, five decorative rows of two-color twining also secure and space the warps evenly. Plain-weave wefts separate the twined borders.

Bijar Knotted-Pile Carpet. Iran
4'9" x 7' (229 cm x 331 cm)

STRUCTURE: Symmetrical knots; H: 14, V: 10, 140 per square inch (H: 55/dm, V: 39/dm, 2145 per sq. dm). Complete warp depression.
YARN SPIN: Z.
WARP: 8-ply white cotton.
WEFT: Various; mainly tan or pink wool singles; 2 shots.
PILE: 2 wool singles.
SELVAGES: Not original.
END FINISHES: 2-color, 4-span twining edged with 8/4 soumak.
[AA-740001. Allan Arthur]

A combination of black and white twining and red rows of soumak make an attractive end finish on this Bijar rug. The absence of ground wefts in this area make soumak a stretchy construction, and the twining is more firm.

Another Bijar example appears on the *Looped Wrapping* page, where countered rows of twining and looped wrapping were both used in an attempt to strengthen the end.

South Persian Kilim
3'10" x 6' (114 cm x 180 cm)

STRUCTURE: Interlocked tapestry.
SECONDARY STRUCTURE: Decorative end band of two-color, two-span twining (4 rows). The colors are offset, and the twist reversed after 2 rows.
YARN SPIN: Z.
WARP: 3-ply cotton; 13 per inch.
WEFT: 2 wool singles; 36 per inch.
SELVAGE: 2 cotton cords; uneven two-color overcasting with 2-ply wool.
[DD-137. Daniel Deschuyteneer]

Perhaps someone can tell us if the uncommon *single interlocked* tapestry structure normally suggests a Lori provenance. Among Asian tribal weavings, I have only seen *twined* bands of the sort shown here on Lori pieces, although they are common on Moroccan rugs from the High Atlas Mountains. An Ouaouzguite example appears on the Heading Cord page.

Four rows of brown and yellow twining, with no intervening weft, make a decorative band at the end of this kilim. After each twined row, the colors were switched, offsetting the colored segments. After two rows, the direction of twist was reversed.

This kilim offers an excellent opportunity for us to compare two structures that are often confused in rug analyses: *dovetailed* and *interlocked tapestry*.

This detail from the kilim above shows an INTERLOCKED structure. Yarns from adjacent color areas are joined *between* the warps. This makes quite irregular pattern edges, but a flat surface. The front and back are the same.

In contrast, this photo shows the much more common DOVETAILED tapestry structure. This is sometimes called "shared warp" tapestry, because two contrasting colored yarns encircle the *same warp* when they meet. In this photo they can be seen clearly *overlapping* on a single warp. Because more yarn is squeezed into those small spaces, ridges are formed at the junctures. The front and back of the kilim look the same.
[Photo: Wayne Barron]

Kurdish Rug. Western Iran
45"x 93" (177 cm x 366 cm)

STRUCTURE: Symmetrical knots, H: 7, V: 11, 77 knots per square inch (H: 28/dm, V: 43/dm, 1204 per square dm). No warp depression.
YARN SPIN: Z.
WARP: 2-ply light tan wool.
WEFT: 2 red wool singles, 2 shots.
PILE: 2 wool singles.
SELVAGES: Overcast with red wool.
UPPER END FINISH: Obliquely wrapped band; warp ends finished on the underside with two rows of overhand knots, offset. Balanced plain weave with 2-color, 3-span twining. See the *Obliquely Wrapped Bands* and *Knotted Meshwork* pages for photos.
LOWER END FINISH: Twined heading cord, followed by 3-strand twining. Balanced plain-weave band with 2-color, 3-span twining.

[MU-100. Mesut Ulusoy]

After a twined heading cord was lashed to the loom, this weaving was begun with a thick row of 3-strand twining. For this, the weaver used three pairs of ivory yarns; these are most clearly seen at the left side of the photo. Such three-strand twining is uncommon.

The plain-weave band is a balanced weave; the row of red and green twining through the center of the band is purely decorative.

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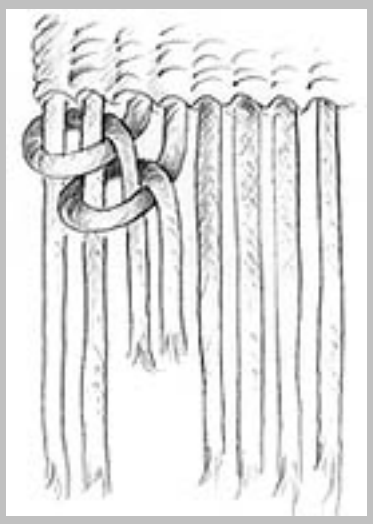
Half-Hitch Bands (Philippine Edges)



Attractive and durable *half-hitch bands*, sometimes called *Philippine edges*, are constructed by forming overlapping half hitches with the warp ends. A pair of warps at the left edge of the rug are held taut, straight out from the rug, and the warp just to the right is looped back around them in a half hitch, emerging next to the fabric. This yarn is tightened, then turned downward, to become one of the next two warps encircled. Sometimes half hitches are tied back around single warp units, so that they do not overlap.

When one row of half hitches is completed across the width of the rug, a second row can be worked in the same manner, in the same direction. This gives the front surface a neat allover braided look, while the back has small horizontal nodules. As many rows can be constructed as desired. Even narrow bands made in this manner, however, are secure.

The structure can instead be worked alternately on a rug's front and back. The two sides are then the same, with ridges formed first on one face, then on the other. If you pull outward on such a band, it will seem quite stretchy, like a *knit* fabric with alternating knit and purl rows. Bands worked alternately on the two sides are straight at both ends, while those worked consistently from the same side slope--inward on the beginning end, outward on the other end. All of those pictured below have been worked on the two sides alternately.

To identify some half-hitch bands, it is necessary to probe a bit with a needle--to see if the yarns actually loop rather than interlace.

Kuba Kilim. The Caucasus
73½" x 42" (290 cm x 166 cm)

STRUCTURE: Slit tapestry.
SECONDARY STRUCTURE: Two-color, two-span twining edges the tapestry bands.
YARN SPIN: Z.
WARP: 2-ply ivory and medium brown wool (barber pole), 15 per inch.
WEFT: 2 wool singles, 40 per inch.
SELVAGES: Paired warps.
END FINISHES: Half-hitch band, worked alternately on the back and front. Warp ends finished with offset overhand knots.
[DD-122. Daniel Deschuyteneer]

Three rows of half-hitches make up the transverse band on this Kuba kilim, and in this example the half-hitches do not overlap. For each successive row the kilim was turned over when it was worked; thus the center row here bulges outward, while on the reverse (below), the first and third rows bulge forward. The warp ends were finished with offset overhand knots.

(Front above; back below)

Kuba (Chi-Chi) Knotted Rug. Caucasus
48½" x 69½" (123 cm x 177 cm)

STRUCTURE: Symmetrical knots; H: 10, V: 13, 130 per square inch (H: 39/dm, V: 51/dm, 1989 per square dm).
Slight warp depression.
YARN SPIN: Z.
WARP: 3-ply tan/ivory wool, barber-pole ply.
WEFT: 3-ply white cotton; 2 shots between knotted rows.
PILE: 2 wool singles.
SELVAGES: 2 warp units (2,1) interlaced and overcast with the ground weft.
END FINISHES: ½ inch half-hitch band, worked alternately on the two faces; weft-faced plain-weave band of white cotton.
[MM-0100. M. Mallett]

As on the kilim above, this band was worked alternately from the front and the back; thus the two faces are nearly identical. The tan and ivory plies in the fine warps obscure the structure.

Kuba ("Perpedil") Knotted Pile Rug. Caucasus
4' x 7'1" (114 cm x 213 cm)

STRUCTURE: Symmetrical knots; H: 13, V: 15, 195 per square inch (H: 52/dm, V: 60/dm, 3120 per square dm).
Severe warp depression.
YARN SPIN: Z.
WARP: 3-ply ivory wool.
WEFT: 2-ply ivory wool; 2 picks, crossed between sheds.
SELVAGES: 2 warp units (2,1) overcast with the white cotton ground weft.
END FINISHES: Half-hitch bands. 3 rows of non-overlapping hitches, worked alternately on the front and back faces.
[DD-127. Daniel Deschuyteneer]

On the front of this half-hitch band two rows of hitches crowd closely together. On the back (below), only the one intermediate row is visible. Units of three warp yarns have been used together, and the hitches do not overlap.

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Knotted Meshwork

It is easiest of all to finish warps simply with overhand knots. A common solution in modern commercial production, this is not among the best of end finishes, as neither warps nor wefts are given more than minimal protection.

Meshwork made with additional offset rows of overhand knots provides more security and is decorative as well. Knots can be tied with either large or small groups of warps--the knots either closely set or widely separated.

Knotted meshwork has often been combined with rows of soumak wrapping--particularly on Caucasian rugs.

Kuba Knotted-Pile Rug. Caucasus
47" x 64" (185 cm x 64 cm)

STRUCTURE: Symmetrical knots; H: 7, V: 11, 77 per square inch (H: 28, V: 43, 1204 per square dm). Slight warp depression.
YARN SPIN: Z.
WARP: 3-ply ivory wool.
WEFT: Tan/brown wool plied with white cotton; 2 shots between knotted rows.
PILE: 2 wool singles.
ATTACHED SELVAGES: 3 free-floating warp units (3,2,1), interlaced with 3-ply faded blue cotton that extends 2 warp pairs into the knotted foundation.
END FINISHES: Knotted meshwork with 3 rows of offset overhand knots. Three rows of soumak (2/1), countered, light blue cotton.
[MM-107. M. Mallett]

Knotted meshwork makes a fragile but decorative end finish on this Kuba rug. (Front)

Three rows of blue cotton soumak wrapping and a couple of plain-weave picks separate the meshwork and knotted pile. Compare the front with the back side below: the front of the soumak has diagonal spans, the back has short wrappings. Twining, which is often used as part of an end finish, looks the same on both sides, and is often done with two contrasting colors. The two structures should not be confused.

Northeast Caucasian Knotted-Pile Rug
5′ x 8′ **(152 cm x 245 cm). Dated 1914. Cyrillic inscription.**

STRUCTURE: Symmetrical knots, H: 29/dm, V: 44/dm, 1276 knots per sq. dm. (82 per square inch). No warp depression.
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFT: Two 2-ply ivory or mixed ivory and brown wool yarns; one shot.
PILE: 2 wool singles.
ATTACHED SELVAGES: 3 warp units (2,2,1), the outer pair free floating, the inner pair irregularly interlaced by the ground wefts, and one warp integral with the ground weave. 2-ply blue wool selvage yarns extend erratically into the pile area and interlace the

first two ground warps.
END FINISHES: 5 rows of soumak, countered (4 blue and 1 white); meshwork of staggered overhand knots.
[FB-103. Filiberto Boncompagni]

Rows of countered soumak in blue and white wool finish this rug, then groups of warps are knotted in a loose meshwork.

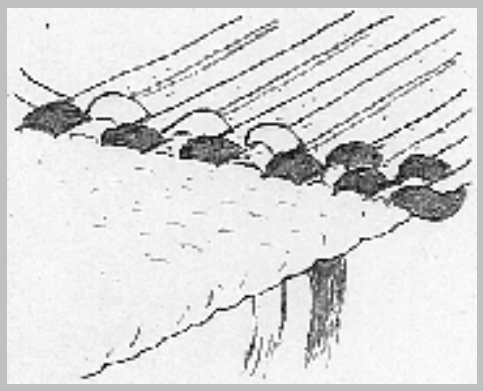
Kurdish Knotted-Pile Rug. Western Iran
45"x 93" (177 cm x 366 cm)

STRUCTURE: Symmetrical knots, H: 7, V: 11, 77 knots per square inch. No warp depression.
YARN SPIN: Z.
WARP: 2-ply light tan wool.
WEFT: 2 red wool singles, 2 shots.
PILE: 2 wool singles.
SELVAGES: Overcast with red wool.
UPPER END FINISH: Obliquely wrapped band; warp ends finished on the underside with two rows of overhand knots, offset. Balanced plain weave with 2-color, 3-span twining.
LOWER END FINISH: Twined heading cord, followed by 3-strand twining. Plain-weave band with 2-color, 3-span twining.
See photo on the *Heading Cords* page.
[MU-100. Mesut Ulusoy]

**The warp ends that emerged on the inside edge
of an obliquely wrapped band have been finished
with two rows of offset overhand knots on this Kurdish rug. Back view.**

**With the wrapped band folded upward, we can
see part of the simple knotted meshwork underneath.**

Weft-Substitution Bands



The *weft-substitution weave* has been used to ornament rugs, bags and other objects in both North Africa and Central Asia. It appears on some Central Asian Turkmen pieces, but since it does not appear, to my knowledge, in Anatolia, the technique is likely to have developed, or at least to have been adopted by Turkmen weavers, AFTER the major westward migrations of Turkic groups.

Our interest here is in the structure's use for narrow decorative borders on pile rugs, or as a secondary structure on knotted-pile bags. It appears most commonly in Baluch work, where it has often been miss-identified as "brocading," "supplementary-weft weave," "interlocked tapestry," "dovetailed tapestry," or even "embroidery." It is none of these! It has also been called "weft-float weave," which fails to distinguish it from the brocading that also sometimes appears on Baluch work. Unfortunately there is not a good popular label for the construction.

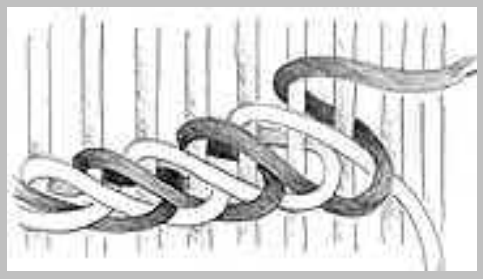
The *weft-substitution* technique has most often been used for intricate patterning. The structure looks exactly like a *weft-faced plain weave* on the fabric's front surface, except for intermittent color changes. (This plain-weave surface most readily distinguishes it from *brocading*.) The weaver simply substitutes one colored weft for another in the plain weave-- thus the name *weft substitution*. In Persian, Afghani, Turkmen and other Central Asian work the yarns are most often left loose on the back, to float between areas where they are used in the pattern. That is shown in the Baluch border below.

**Weft-substitution border on a Baluch knotted pile sofreh, front and back.
Photos: Mark Hopkins**

In some Baluch bags, and also on the skirts of pile rugs, the weavers have reversed patterning yarns to avoid floats over wide pattern areas. The weaver of the bag below has switched methods midstream in her broad orange and brown chevron pattern: in the lower section she tried floating her brown yarns, while reversing the orange. Then she tried reversing both orange and brown. It is the same structure, whether the yarns are reversed or not: *weft substitution.* Long floats are obviously impractical, because they can easily snag.

**Baluch weft-substitution bag, back side.
Photo: Daniel Deschuyteneer**

Wrapped and Bound Borders



Narrow raised borders often accompany *weft-substitution* patterning in Baluch weavings. A specialized kind of soumak, done in two colors, these borders are *wrapped and bound.* The detail is often used to edge or enclose the intricately patterned borders. The narrow edgings look, at a glance, like slightly lop-sided braiding; as the diagram shows, however, the yarns are wrapped, not braided. Pairs of wrapping yarns are used, and one binds the other down in a forward position.

This clever technique may prove to have significance in helping to separate groups of Baluch weavings. Since it has been given virtually no attention, I think it should be interesting to see in precisely what pieces it is found--and in which it does NOT appear. There are a couple of early examples below which display simple twining instead, another which uses soumak.

In this detail scan of a modern Baluch trapping, the lower *wrapped and bound* border was done as in the diagram above--with the wrapping yarns enclosing pairs of warps. In the upper row, the wrapping encloses just single warps, so that the structure is condensed. The lower version prevails on older weavings--at least those in which the edgings are not twining or soumak instead.

Baluch Saddlebag Face
17"x 21½" (43 cm x 54 cm).

PRIMARY STRUCTURE: Asymmetrical knots, open left. H: 7, V: 10, 70 per square inch (H: 28/dm, V: 39/dm, 1092 per square dm).
Pile inclines upward. No warp depression.
SECONDARY STRUCTURES: Weft-substitution bands, edged with wrapped and bound borders.
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFT: 2 olive green/brown wool singles; 2 shots.
PILE: 2 wool singles.
SELVAGES: 2 warp units (2,2), interlaced by the ground wefts.
UPPER END FINISH: Plain weave hem, 2 wool singles.
LOWER END FINISH: Plain weave, 2 wool singles.
[MM-1087. M. Mallett]

The small weft-substitution border design shown here is the most common of all on Baluch knotted-pile weavings.

Each pair of narrow wrapped and bound borders on this saddlebag is separated by a single row of asymmetrical knots, either brown or salmon-colored.

Back of the weft-substitution patterning and accompanying wrapped and bound borders. The wrapped segments are short on the back. When twining is used instead, the structure is the same on front and back.

Baluch Khorjin. Khorassan, Northeast Persia
Pile Face: 20"x 21" (50 cm x 55 cm)
Back: 20" x 21" (50 cm x 55 cm). Circa 1900.

PRIMARY STRUCTURE (Front): Asymmetrical knots, open left; H: 9, V: 11, 99 per square inch (H: 35/dm, 43/dm, 1505 per square dm). Fine and regularly woven, with no warp depression.
SECONDARY STRUCTURES (Bag's back side and front upper and lower borders): Weft-substitution weave in both wide and narrow bands. Wefts are discontinuous in the wide bands. Narrow 2-color wrapped and bound borders edge the pattern bands.
SECONDARY STRUCTURES (Closure system): Weft-faced closure band decorated in weft-substitution weave; braided closure loops with 6-span, 2-color twining between the loops; also 3-span two-color decorative twining.
YARN SPIN: Z.
WARP: Fine, tightly plied 2-ply ivory wool.
GROUND WEFTS, pile area: 2 dark brown wool singles; 2 shots between knotted rows.
WEFTS, flat-weave areas: 2 wool singles; 50 per inch.
PILE: 2 wool singles.
SELVAGES: Right side: 2 sets of paired warps; Left side: no special treatment. 6 warp units on the right, and 4 on the left are unknotted.
[DD-108. Daniel Deschuytneer]

Wide chevron borders like these have often been mis-identified. Such details are easily confused with *double interlocked tapestry.* But all three borders here--wide and narrow--are the same structure: weft substitution.

The blocky "S" border shows the brown and blue yarns floating where not used in the pattern. They are continuous from one side of the weaving to the other. The ivory yarns

float underneath. The more delicate undulating border is made in the same way.

Since in the wide chevron border, such floats would be very long, the weaver has reversed each color at the end of each intricate area, to weave back and forth.

Baluch Knotted Pile Rug. Southwestern Afghanistan or Seistan region of Iran.
41" x 49" (105 cm x 125 cm). C. 1950.

STRUCTURE: Asymmetrical knots, open left; H: 7, V: 11, 77 per square inch (H: 28/dm, V: 43/dm, 1161 per square dm). No warp depression.
SECONDARY STRUCTURES: Wide weft-substitution borders patterned with blue and ivory squares; narrow two-color wrapped and bound borders.
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFT: 2 wool singles; 2 shots.
PILE: 2-ply wool.
SELVAGES: Right side, 4 warp units (1,1,1,1, the outside two units corded), double-looped in pairs with brown-black goat hair. Left side, 2 cords only.
UPPER END FINISH: Band of oblique wrapping; the warp ends wrap upward, then interlace downward. (For a better photo of this detail see the *Obliquely Wrapped Bands* page.)
LOWER END FINISH: Long (3½") warp loops. A row of twining and two heavy wefts

start the weave.
[DD-107. Daniel Deschuyteneer]

In this weft-substitution border, the weaver has floated blue wefts on the back where they are not used in the design; they are continuous from side to side. She has cut the white yarns, however, and left long ends as decorative pile on the back.

(Front above; back below)

See the *Obliquely Wrapped Bands* page for a discussion of the warp-end finish.

Knotted Pile Baluch Sofreh
2'2" x 3'10" (102 cm x 181 cm)

STRUCTURE: Symmetrical knots, H: 10, V: 8, 80 knots per square inch (H: 39/dm, V: 32/dm, 1248 knots per sq. dm)
SECONDARY STRUCTURE: Bands of weft-substitution weave. Tiny wrapped and bound borders.
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFT: 2-ply tan/gray wool; 2 shots.
PILE: Wool.
SELVAGES: 4 warps (cords), reinforced with brown goat hair.
PUBLISHED: Dennis R. Dodds and Murray L. Eiland, Jr., eds., *Oriental Rugs from Atlantic Collections*, Philadelphia, 1966, Plate 317.
[MH-101. Mark Hopkins]

At each end of this early weaving, three borders are patterned with the weft-substitution technique. In the broad chevron band, the yarns float only in the intricate areas-- not over the wide, plain sections.

Baluch Knotted-Pile Prayer Rug
2'10" x 4'4"

SECONDARY STRUCTURES: Bands of weft-substitution weave. Narrow soumak borders, with red and blue yarns combined and used as one.
PUBLISHED: Mark Hopkins, "Doing the Baluch Bend," HALI 93, p.81, Plate 7.
[MH-102. Mark Hopkins]

Three weft-substitution bands. In the wide middle band the pattern wefts reverse at the design edges, rather than floating. In the wide lower border, blue and brown yarns are discontinuous, interlacing back and forth in the small sections where they are needed, while the white yarns are continuous. The weft-substitution structure is the same throughout--worked in each area in the way that best suits the design.

The tiny raised borders separating the weft-substitution bands appear to be soumak on this piece, with a blue and a red yarn combined and worked as one, twisting together erratically.

Baluch Knotted-Pile Prayer Rug
2'6" x 4'1" (76 cm x 122 cm)

SECONDARY STRUCTURES: Bands of weft-substitution weave. 2-color, 2-span twining.
PUBLISHED: Mark Hopkins, "Doing the Baluch Bend," HALI 93, p. 79, Plate 3.
[MH-104. Mark Hopkins]

Here again, wide chevron bands are woven with substituting wefts. The structure has been confused with various kinds of tapestry--interlocked, dovetailed or slit-tapestry--but the technique is weft substitution. Blue and red yarns follow plain-weave interlacement paths, with one substituting for the other to make the small alternately colored columns. On the back side it is easy to see the horizontal path taken by each yarn, just as in the white border. At the ends of the large red and blue projecting shapes, these yarns reverse, so as to not float over such large plain areas, and here they leave slits such as in slit tapestry.

The same "slits" occur in the examples above; in those weavings the slits are just much shorter--perhaps only the height of two or three yarns. This minor feature occurs naturally within the weft-substitution technique, and is not reason for categorizing the technique as "slit tapestry."

There is no "interlocking" element here. Likewise, no "dovetailing." With dovetailed tapestry, yarns meet and share warps--so that both the front and back of the fabric look the same. For photos comparing those two structures, see the *Twining* page.

At the top of this photo, above the white border, we can just barely see a small row of red and brown twining. This was used in lieu of the tiny wrapped and bound borders that appear in so many Baluch pieces. Is this twining typical of earlier weavings, or weavings from particular areas? More examples are needed!

A Slit-Tapestry Comparison

In contrast to the weft-substitution borders shown above, the piece at the right has bold chevron borders of slit tapestry. Such details have not been carefully separated in rug literature, and weft-substitution details have been erroneously described as one sort of tapestry or another.

Baluch (Aimaq ?) Knotted Pile Rug
3' x 7'10" (142 cm x 370 cm)

STRUCTURE: Symmetrical knots, with 3 wool singles.
SECONDARY STRUCTURES: Bands of slit tapestry. Bands of weft-substitution weave. Narrow bands of countered, two-color, two-span twining.
[MH-105. Mark Hopkins]

In contrast to the bold chevron borders on many Baluch rugs, here the structure is slit tapestry. On the back side, yarns are floated upward to start the next step.

The very narrow two-color edgings here are countered twining. This technical feature, along with slit tapestry, sets this piece apart from a majority of Baluch pile weavings. The narrow white diamond borders are standard weft-substitution, although an unusual motif.

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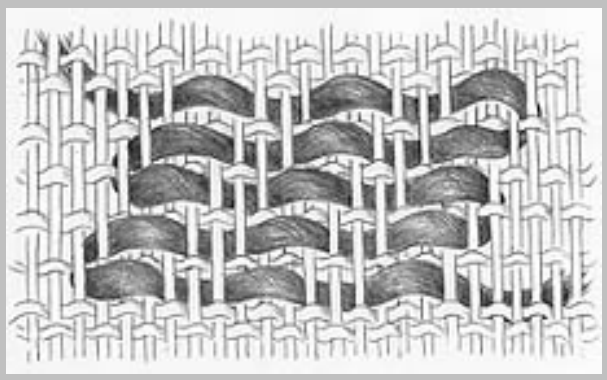
Assorted Brocade Borders

Brocades have been an important part of the nomadic weaver's technical repertoire, and several types turn up as decorative borders on pile rugs. We will collect assorted examples here.

Overlay-Underlay Brocade



This is the most versatile and indeed the most common kind of brocading found in the Middle East. It is the woven structure often mistaken for embroidery.

With their fingers, brocade weavers interlace either short lengths or tiny skeins of loosely-spun pattern yarns. These yarns are often doubled or tripled, so that they cover the ground well and do not look 'skimpy.' The thick, fluffy brocading yarns lie or float on the front surface of the fabric to form the design, then float on the back to produce negative design parts--thus the term *overlay-underlay*. The loom does nothing during the process to help the weaver: With the shed closed, she does it all, pushing the yarns alternately from front to back to form the design. After interlacing all of the colors in each row of patterning, she lays in at least one thin plain-weave ground weft from selvage to selvage, using a regular shed.

For more detailed information on brocading, please see Chapter 13 in *Woven Structures*.

Jaf Kurd Saddlebag Face
36"x 27½" (92 cm x 70 cm)

PRIMARY STRUCTURE: Symmetrical knots; H: 5, V: 13, 65 per square inch (V: 20/dm, H: 51/dm, 1021 per square dm. Offset knotting used to articulate the field design; transitions made with overlapping knots. Extensive use of discontinuous wefts to correct problems. No warp depression.
SECONDARY STRUCTURES: 3 cm-wide band of overlay- underlay brocading in 'diagonal comb' pattern. .8 cm- wide band of weft-float pattern in a zigzag motif, edged with rows of 2-color, 2-span twining. Heavy groups of 3 or 4 wool singles used for these details.
YARN SPIN: Z.
WARP: 3-ply ivory wool.
WEFT: Primarily 2-ply brown wool, but also various colors combined and alternated; peach-colored singles in some areas. Wefts crossed between sheds.
PILE: 1, 2 or 3 wool singles, mostly 2.
OVERCAST SELVAGES: 3 warp units (1,1,1) overcast with brown wool singles.
[AA-9966. Allan Arthur]

In the wide brocaded border of this Jaf bag face we can just barely see the thin pink ground wefts. A weft-float border of black and ivory occupies the center; red and ivory rows of twining separate the bands and edge the knotted pile area.

The back of the brocaded border.

Since brocade weavers nearly always work from the back side of the fabric, and knotted-pile weavers from the front, we sometimes find the structure of decorative brocaded bands reversed on pieces like our next example, a Gaziantep rug. We can assume that this weaver probably had some prior experience as a brocade weaver, and she apparently thought that the normal "back" was quite presentable, as long as she did not leave any loose weft ends on the front of her rug.

This odd, but not unusual practice sometimes occurs on saddlebags in which we see the back of a strip of brocading serving as the "front" of the bridge. If the brocade front actually faces outward on such a bridge, it suggests that the weaver may have gone around to the other side of the loom to do just that one bit of work, although that would not have been essential.

Gaziantep Knotted-Pile Rug
Southeastern Anatolia. 32" x 57" (223 cm x 127 cm)

SECONDARY STRUCTURE: Decorative bands of overlay-underlay brocading, with the normal "back" side used for the front. Two-color, two-span twining edges the brocading.
[DD-136. Harry Koll]

On the front surface of the Gaziantep pile rug, overlay-underlay brocading displays the face of the pattern that we normally would call the "back."

The under side of the rug, below, shows the normal "front" face of the brocading.

Jaf Kurd Saddlebag
29" x 37 1/2" (74 cm x 95 cm)

PRIMARY STRUCTURE: Symmetrical knotting, H: 4.5, V: 12, 54 per square inch. Knotting offset throughout the field to articulate diagonals. Slight warp depression.
SECONDARY STRUCTURES: Wide bands of overlay- underlay brocading on the ends of the bag faces, and also on the back, where they are bordered with weft-float patterning. These bands alternate with bands of weft-faced plain weave.
YARN SPIN: Z.
WARP: 2-ply ivory wool.
WEFT: 2 picks between rows of knots.
[FB-101. Filiberto Boncompagni]

Front and back of overlay-underlay brocading on the back of the Jaf Kurd saddlebag.
The narrow borders are weft-floating patterning.

Overlay-underlay brocading on the front (ends) of the
Jaf Kurd saddlebag.

Back of the Jaf Kurd saddlebag with
wide bands of overlay-underlay brocading and narrow borders of weft-float patterning.

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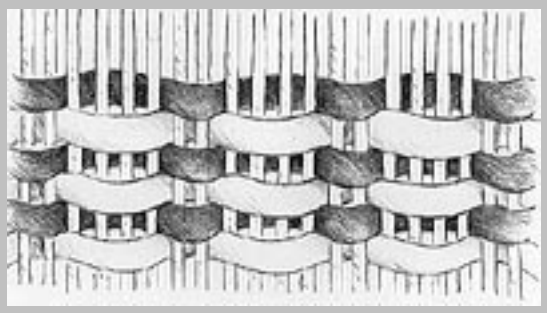
Complementary-Weft Borders

This structure, with its characteristically intricate patterns, has been used primarily for decorative borders--both on flatweaves and on the skirts of knotted-pile objects. It is not actually an 'end finish,' however.



In a *complementary-weft weave,* weft yarns of contrasting colors are used in pairs, and each weft complements the action of the other exactly. If a light weft passes over four warps and under two, its dark-colored companion follows, passing under four warps and over two. The sequences are changed to vary the patterns: some wefts might go over and under 3 warps, or they might go over 5 and under 1, but they are always used in complementary pairs. All wefts are allowed enough ease to cover the warps completely, making this a weft-faced weave.

When only two colors are used, the back and front faces are similar. The interlacement pattern is the same on both; the position of the colors is merely switched. Small X's, for example, may be light on one face and dark on the other.

Typical patterns are very small: little triangles, diamonds and rosettes predominate. The blocky Qashqa'i so-called 'domino' border features one of the more complex motifs. Perhaps someone can send us an example of that.

The only real confusion in identifying this structure sometimes occurs when twill and pointed twill designs are articulated with this method. If those

have thin ground wefts hidden underneath, they are *brocaded* instead. We will gather twill examples on a separate page.

Northwest Persian Rug
49" x 83½" (124 cm. x 212 cm.). Circa 1950.

PRIMARY STRUCTURE: Symmetrical knots, H: 4.5, V: 7, 31.5 knots per square inch. (H: 18/dm, V: 28/dm, 504 per square dm). No warp depression.
SECONDARY STRUCTURES: Complementary-weft weave bands (in X and rosette motif) in red and blue, or brown and blue wool singles. Single and triple rows of 2-span black goathair twining edge and separate the pattern bands; white cotton is also twined with the goat hair for accents.
YARN SPIN: Z.
WARP: 3-ply undyed cotton.
WEFT: 2 picks of thick light blue cotton; in some areas, two-ply brown wool alternates with cotton. Wefts cross between sheds.
PILE: 2 thick wool singles; height: 1 cm.
SELVAGES: 2 warp units (1,1) interlaced by the ground wefts. Remnants of variously colored wool singles can be seen in the area under later overcasting.
UPPER END FINISH: Oblique wrapping with the ends interlaced downward.
LOWER END FINISH: Twined cotton heading cord.
[DD-103. Daniel Deschuyteneer]

Complementary-weft weave borders along with black goathair twining. The patterning reverses exactly from the front side to the back. The rug's twined cotton heading cord can be seen in both of these photos, edged with black goathair twining.

Back side of the rug above.

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Twill Pattern Borders

Decorative 'twill' patterned borders have been produced in a variety of ways, and here our goal will be to sort them out. Some superficially similar weaves have hidden features with diagnostic importance-- particularly among South Persian textiles.

Reciprocal Brocading in a Twill Pattern

Heavy, colorful pattern yarns alternate in this weave with thin, hidden ground wefts. We must probe with a needle to find these wefts underneath--they are not visible in photos.

Saddlebag Face. South Persia
23½"x 23" (60 cm x 58.5 cm)

PRIMARY STRUCTURE: Symmetrical knots; H: 9, V: 9, 81 per square inch (H: 35/dm, V: 35/dm, 1225 per square dm). Pile inclines upward. Moderate to severe warp depression. Liberal use of discontinuous wefts. SECONDARY STRUCTURES: Reciprocal brocading (twill and pointed twill patterns) in the closure strip; Overlay/underlay brocaded borders; 2 color, 4-span twining for narrow borders.
YARN SPIN: Z.
WARP: 2-ply mixed brown/grey/tan wool.
WEFTS: 4-ply sinuous white cotton

alternates with 2 taut wool singles for 2 shots between knotted rows.
PILE: 2 wool singles.
OVERCAST SELVAGES: 2 warp units (2,2), overcast with red wool singles.
UPPER END FINISH: Hem.
[MM--0102. M. Mallett]

On this saddlebag face with "twill" patterning in a *reciprocal brocade,* the tiny red ground wefts are only visible if you probe with a needle.

The red and blue borders on either side of the "twill" are *complementary-weft weave.* The black and white borders are *twined,* as are a couple of the red and blue borders; these are all rather mixed together.

Tassels are formed with loose loops of unknotted yarn; fragments of an original binding on the front survive.

Complementary-Weft Weave in a Twill Pattern

Twill patterning that looks very similar to that above appears without any ground wefts underneath. Instead, two weft elements of contrasting colors merely follow opposite, complementary paths. In the diagram, the first yarn weaves over and under two warps; a contrasting color then follows, weaving over and under the opposite warps. The next two-color sequence is offset by one warp.

Neither this weave nor the brocade weave described above are actual twill weaves, but are structures that imitate twill.

Reversals in the twill-pattern alignment are easily formed by changing the direction in which floats are offset. 'Pointed twill' zigzags or diamonds can be formed by varying the length of selected floats.

Khamseh Saddlebag Face. South Persia
28" x 28" (70 cm x 71 cm)

PRIMARY STRUCTURE: Symmetrical knots; H: 7.5, V: 10, 75 per square inch (H: 30/dm, V: 42/dm, 1260 per square dm). No warp depression.
SECONDARY STRUCTURES: Complementary- weft weave with four-span floats (pointed twill pattern) in the closure strip, also in a separate narrow band; 2-color twining.
YARN SPIN: Z.
WARP: Two-ply dark brown wool, loosely plied.

WEFT: Medium brown or ivory wool, one or two singles; 2 picks. Wefts do not cross.
PILE: 2 wool singles.
OVERCAST SELVAGES: 2 warp units, each a cord made with three wool warps replied; overcast with red wool singles.
[DD-139. Daniel Deschuyteneer]

It is notable that along the top end of this bag face the old standard complementary-weft "domino" motif has been copied in knotted pile.

Unlike the closure strip on the first bag, this "twill" motif is woven with no ground weft, and thus is a *complementary-weft weave*. Without a tiny invisible plain weave underneath, the structure is less stable, and wide gaps have resulted between the variously colored discontinuous sections.

A narrow border of pink and green twining edges the narrower complementary-weft band.

Hamadan area rug. West central Persia
3'3" x 4'6" (154 cm x 213 cm)

PRIMARY STRUCTURE: Symmetrical knots; H: 9, V: 10, 90 per square inch (H: 35/dm, V: 39/dm, 1365 knots per square dm). No warp depression.
YARN SPIN: Z.
WARP: Cotton.
WEFT: One weft shot between rows of knots; brown wool is plied with white cotton and used along with 2 thin brown wool singles.
PILE: 2 wool singles.
OVERCAST SELVAGES: Two warp units of 4-ply wool, overcast with black wool or goathair.
LOWER END FINISH: Red and blue wool heading cord of countered twining; band of complementary-weft weave in a pointed twill pattern, edged with single rows of soumak.
UPPER END FINISH: Complementary-weft weave band in a pointed twill pattern, edged with soumak.
[JB-100. Jim Bowen]

Opinions on a more exact attribution for this rug have ranged from Maslaghan to Bakhtiari. As with any of the rugs included on these pages, we will appreciate information that can firmly establish the provenance.

The *complementary-weft* band of red and green on this rug forms a pointed twill pattern. A heading cord was made with two countered rows of twining in red and green. We see only one of the two rows here; the second is underneath. See the *Heading Cords* page for more information on these constructions. Heavy rows of black soumak wrapping edge the band.

In this frayed section, the interlacing sequence of the red and green complementary- weft weave can be clearly seen. No ground weft was used.

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Asian Looms

Marla Mallett

On this temporary page I am collecting photos of Asian village and nomad looms to use in a discussion of warping practices and end finishes. This is a call for help: I will welcome contributions from anyone who finds good photos--or even not-so-good photos--that are informative. We need to see at least one end of the loom clearly, to determine how the warp is attached to the beam. After a nice group is assembled, I will use the most informative examples from a variety of places, along with drawings, to explain the relationships between specific loom set-ups and some of the end finishes in our database.

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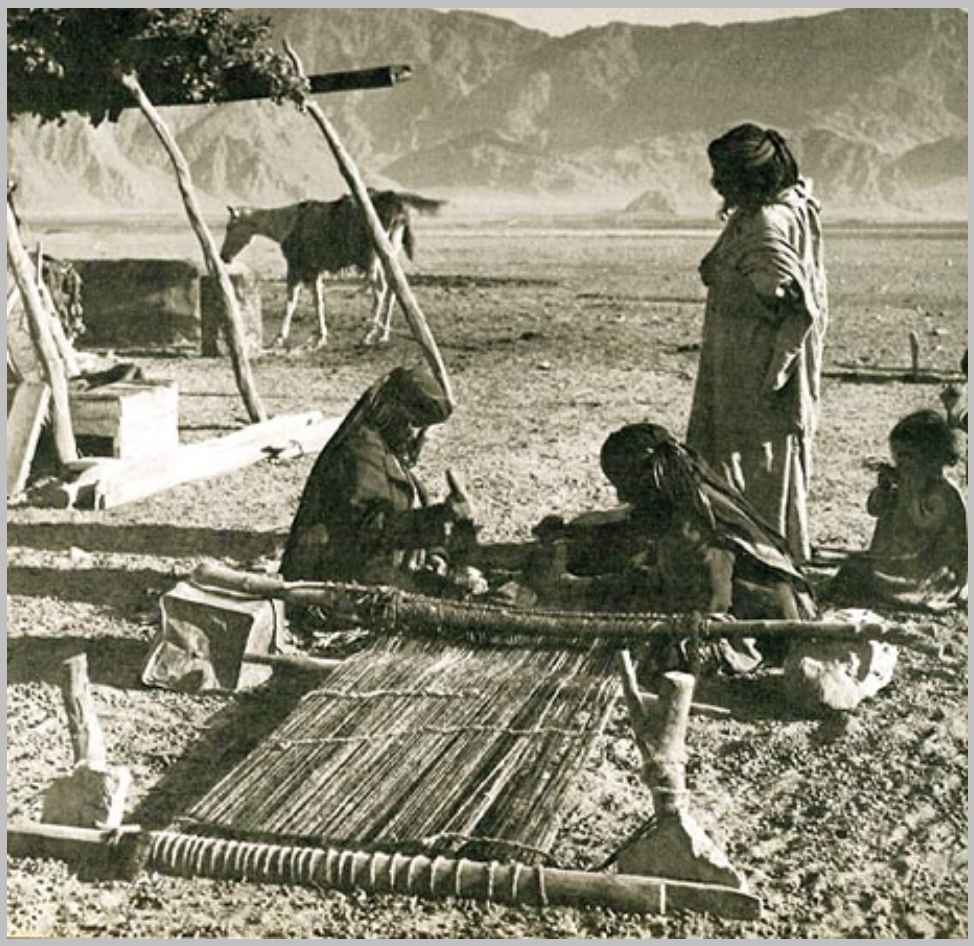

Lori weavers near Khorramabad, Iran. Mid-20th century. Yörük, *Pittsburgh, A. Landreau, ed., 1978, p. 50.*

Tabriz loom. Weavers waiting for the carpet to be pulled downward. Cecil Edwards, The Persian Carpet*. Figure 10, p. 23.*

Lor weavers near Khorramabad warping a vertical frame loom. Mid-20th century. Yörük, *Landreau, ed., Pittsburgh, 1978, p. 14. Photo: A. Landreau.*

Preparing warps in Arak (Sultanabad). Cecil Edwards, The Persian Carpet, *Figure 15, p. 28.*

Brocade weavers in the Tarus Mountains of south-central Turkey. Photo: M. Mallett

Weavers in the Kurdish village of Seh Gabi, Kangavar valley in central western Iran. Photo: Louise D. Levine, "Notes on Felt-Making and the Production of Other Textiles at Seh Gabi, a Kurdish Village," Studies in Textile History, *ed., Veronika Gervers, Toronto, 1977, Figure 13.*

Kurdish weavers in Shiva village, between Bijar and Dehgolan, Iran. Arshi and Zabihi, Kurdistan, *Plate 23. Photo: Nasrolah Kasraian.*

Turkmen weavers. **National Geographic, November 1973, p. 656.**

Weaver in Orsille, Yuntdag area of western Turkey. Photo: M. Mallett

Two-harness loom in Bigadiç, northwestern Turkey. Photo: M. Mallett

Young weaver in the Yuntdag area of Western Turkey. Photo: M. Mallett

Tabriz workshop.
John Kimberly Mumford, **Oriental Rugs,**
New York, 1929, p. 237.

Loom from Kuba District, c. 1900.
Wright and Wertime, **Caucasian Carpets and Covers,** *p. 35*

Kurdish silk weaver. Hawraman-i-Takht village, western Iran. Arshi and Zabihi, **Kurdistan,** *Plate 71. Photo: Nasrolah Kasraian.*

Two two-harness looms built in one frame. Siirt, Turkey. Photo: Mehmet Kiliç.

Egyptian weaver Garia Mahmoud. Harrrania. Photo: M. Mallett

Navajo loom. American SW.

If you find a loom photo or have one that you would be willing to share, please E-mail me: *marlam@mindspring.com*

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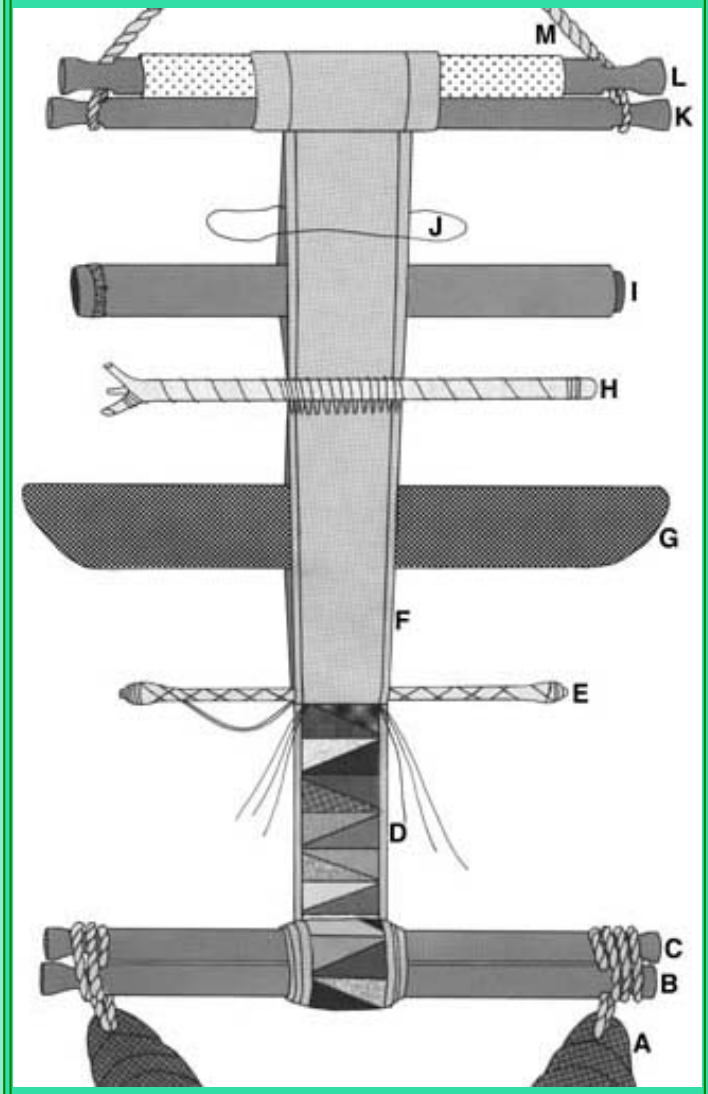
El Telar de Cintura de Jacaltenango, Guatemala



Este **cordel (M)** en forma de una "Y" tiene un ojal de dos pulgadas en cada uno de los dos extremos cortos. La punta larga del lazo tiene un promedio de cincuenta y tres pulgadas de largo, mientras que cada uno de los extremos más cortos tienen un promedio de catorce pulgadas. **El cordel de encruzamiento (J)** se amarra en la calada mientras la urdimbre todavía está en el urdidor en donde se va a colocar la barra de la calada. El cordel de encruzamiento mantiene el orden de los hilos de la urdimbre hasta que la cinta esté completamente tejida. Cuando el rollo de la calada se zafa fuera de su posición (a veces esto sucede cuando el telar no está bajo tensión), el hilo de encruzamiento se levanta para formar una apertura, entonces se puede colocar el rollo de la calada de nuevo en su lugar. **El rollo de la calada (I)** divide la urdimbre a la mitad. En Jacaltenango siempre se construye de una caña hueca o de bambú. Muchas veces tiene semillas o piedritas adentro para hacer ruido cuando la cinta está golpeado con el batidor. Las coyunturas naturales de la caña forman un extremo del envase y se tapa el otro extremo con papel después de meter las semillas o las piedritas. El rollo de la calada tiene un promedio de tres cuartos de una pulgada en el diámetro y es de la misma longitud que las varillas de la punta e igualmente se vuelven cafés y lustrosas con la edad y con el uso. **La varilla del lizo (H)** consiste de un palo sin corteza, aproximadamente ocho pulgadas de largo, que tiene tres ramitas cortadas o más en un extremo. El hilo del lizo se envuelve espiralmente alrededor del palo. Los lizos realmente están más juntos de lo que aparecen en la ilustración. La tejedora también estima mucho la varilla de lizo; no quiere desprenderse de ella. Cuando encargaba telas que todavía estaban en el telar, tuve que dar un juego de cuatro varillas de extremo, un batidor, y un palo de lizo a causa del cariño que sienten las tejedoras por estas partes de telar. **El batidor (G)** se hace de una madera dura y comúnmente mide alrededor de once pulgadas de largo y una pulgada y cuarto de ancho. El borde grueso redondo superior se ahusa hasta que quede el borde filado como cuchillo en el fondo. Quizás el batidor sea la parte más preciosa del telar para las tejedoras. A veces se heredan de madre a hija. **La urdimbre (F)** puede ser sencilla o doble para las cintas. Las cintas floreadas y las geométricas rayadas se tejen comúnmente con una sola urdimbre. Las otras cintas geométricas se tejen con una urdimbre emparejada. **La canilla (E)** se hace de un palo delgado sin corteza. Tiene aproximadamente siete pulgadas de largo. Tiene una trama envuelta en forma espiral alrededor del palo que va de un lado a otro. **Los hilos suplementarios de la trama (D)** son tramas extras. Si se quitaran, la integridad de la tela tejida permanecería intacta. Las **varillas de la punta de la tela (B y C)** y **las varillas de la punta de la urdimbre (K y L)** sólo tienen que ser lo suficientemente largas para sostener la urdimbre y permitir que fácilmente se estire el telar entre un respaldo y la tejedora (como regla general la anchura de la urdimbre más unas cuatro pulgadas de cada lado). Las cuatro varillas tienen un promedio de diez pulgadas de largo y una media pulgada de ancho. Las varillas de la punta del telar le son preciosas a cada tejedora. Son estimadas y codiciadas cuando se vuelven viejas y de color café. El tamaño promedio del **mecapal (A)** es de dos pulgadas por dieciocho pulgadas, con dos lazos de quince pulgadas.

Tejiendo con el telar de cintura / palitos en Jacaltenango

page in english

En Mesoamérica el tejido era del dominio de la mujer hasta la introducción del telar de pedal por los españoles en el siglo XVI. Hoy el telar de pedal domina la producción textil en Guatemala y lo usan mayormente los hombres que producen la tela de algodón y de lana comercialmente. La mayoría de las mujeres mayas siguen tejiendo en el telar de cintura precolombino cuando no se dedican a sus quehaceres. Aunque tejer con el telar de palitos no es tan rápido como el de pedal, las partes del telar son baratas y el telar es portátil. En el telar de palitos la urdimbre se estira entre un respaldo y el cuerpo de la tejedora. La anchura de la tela tejida en este telar comúnmente no tiene una anchura de más de treinta pulgadas, el alcance de la tejedora. La tela comúnmente se teje a la medida exacta requerida y puede ser tejida terminada en los cuatro lados.

El mecapal pasa detrás de la espalda de la tejedora y está amarrado a los dos extremos de la varilla de tela. Un cordón está amarrado a los dos extremos de la varilla superior de la urdimbre y está enlazado a un respaldo. El telar es portátil, pero fatigoso de operar porque la tejedora constantemente tiene que ajustar y mantener la tensión de la urdimbre.

La urdimbre, que está amarrada a dos barras del telar, debe ser fuerte para mantener la tensión. Una varilla de lizo está amarrada a cada dos urdimbres. Cuando la varilla de lizo se levanta, se forma una apertura de calada, dejando pasar por la apertura el hilo de la trama. Se quita el batidor al mismo tiempo que la tejedora se inclina un poco hacia el frente y levanta la barra del lizo con una mano mientras empuja hacia abajo con el batidor sobre las urdimbres con la otra mano para crear la otra calada.

La tejedora se inclina hacia atrás causando una tensión que hace que los hilos de la urdimbre estallen arriba entre los lizos, formando la apertura de la otra calada mientras descansan sobre el rollo de la calada. Un batidor empuja la trama para abajo, luego se pasa otra trama por la apertura nueva de la calada. La tejedora se inclina para adelante mientras levanta la barra del lizo y se repiten las acciones. Repitiendo este procedimiento, se lleva a cabo un tejido sencillo, la más sencilla de las estructuras tejidas.

Las jakaltekas usan la técnica suplementaria de doble cara para crear varios motivos. Con esta técnica el anverso y el reverso del tejido son casi idénticos porque las tramas suplementarias se envuelven alrededor del mismo número de urdimbres en el anverso y en el reverso del fondo. Las tejedoras usan el dedo índice y el pulgar de una mano para separar las urdimbres y los dedos correspondientes de la otra mano para meter repetidamente la trama suplementaria de anverso a reverso o de reverso a anverso a través de la fila. Las tramas suplementarias no son esenciales para la estructura de la tela, pues si se quitaran se quedaría una tela tejida ordinaria.

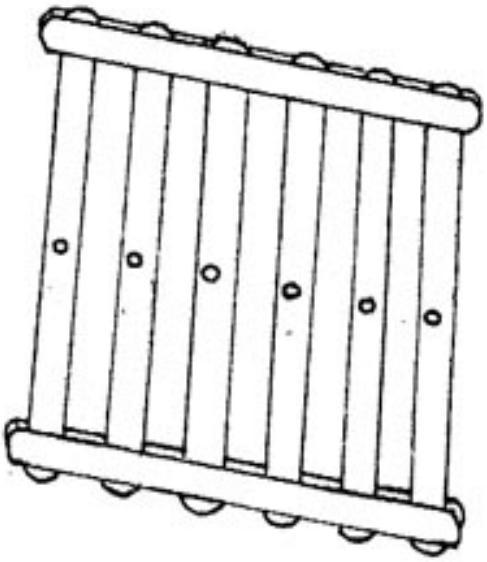
Cintas Jakaltekas de 1927 a 1986

ACTIVITY 7: A BACKSTRAP LOOM PROJECT FOR THE CLASSROOM

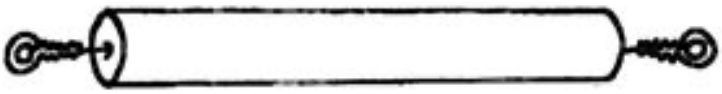
Materials:

10 Popsicle sticks - 6 with drilled holes, 4 plain 5 m of white string cut into 1 m lengths to use as warps 1 more piece of rope or ribbon long enough to go around your waist 6" piece of dowel 2 eye screws 1 'S' hook that can hook on to an eye screw Yarns and strips of cloth to use as wefts

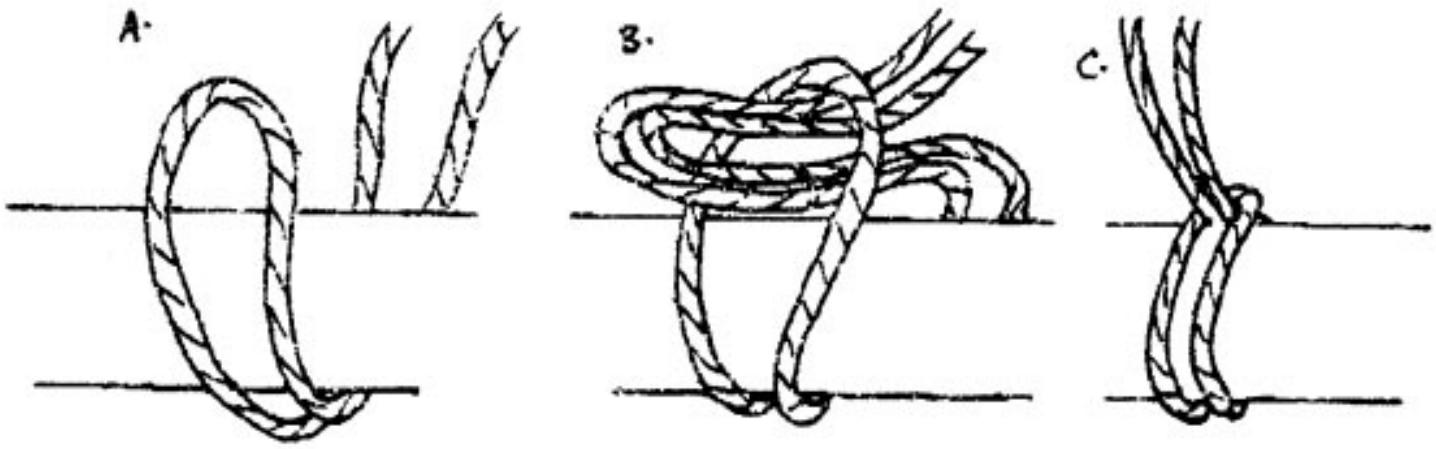
1) Glue the Popsicle sticks together:



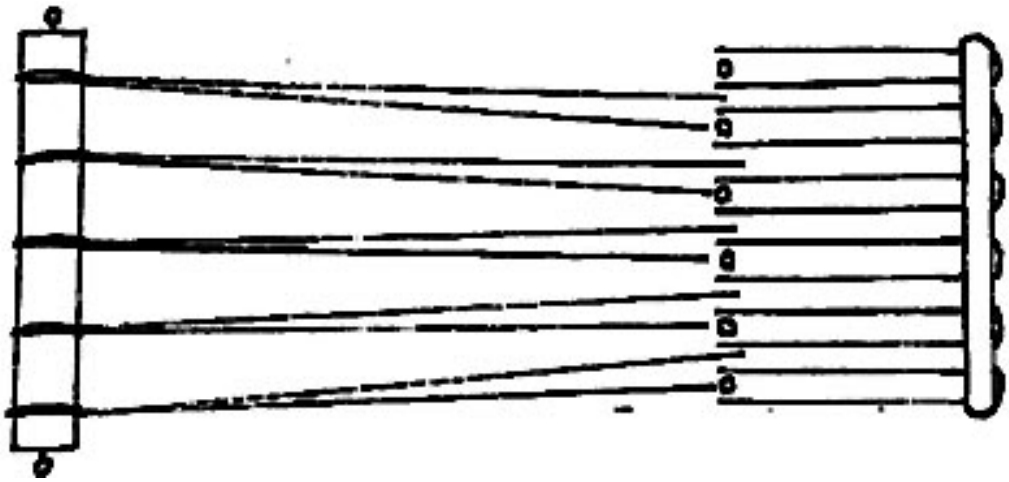
2) Screw the eye hooks into the ends of the dowel:



3) Fold the 5 white strings in half and loop each one over the dowel:



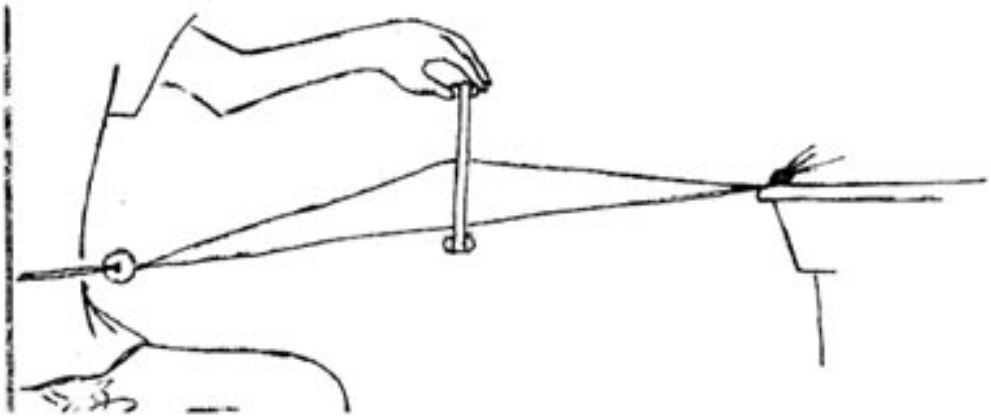
4) You now have 10 string ends in pairs. Thread these through the heddle, keeping them in order. One end from each pair goes through the gap, one goes through the hole:



5) Tie the rope or ribbon to one eye hook and tie the 'S' hook to the other end. This is the strap that goes around your back.

6) Gather the ten string ends together and tie them in a knot. Tape the knot to the edge of your desk. Loop the rope around your back and fasten to the eye screw.

7) You are ready to weave! With one hand raise up the heddle to separate half the warp ends. With the other hand guide a piece of yarn or strip of cloth through the opening. With the heddle push the weft in place against the dowel. By lowering the heddle you can create the opposite shed and insert another piece of weft.



8) Carry on weaving until your warps are filled with weft, then remove the ends from your desk, untie the knot and tie 3 or 4 knots to finish the end of the weaving.

Contents Made by Hand/Hecho a Mano

THE BACKSTRAP LOOM

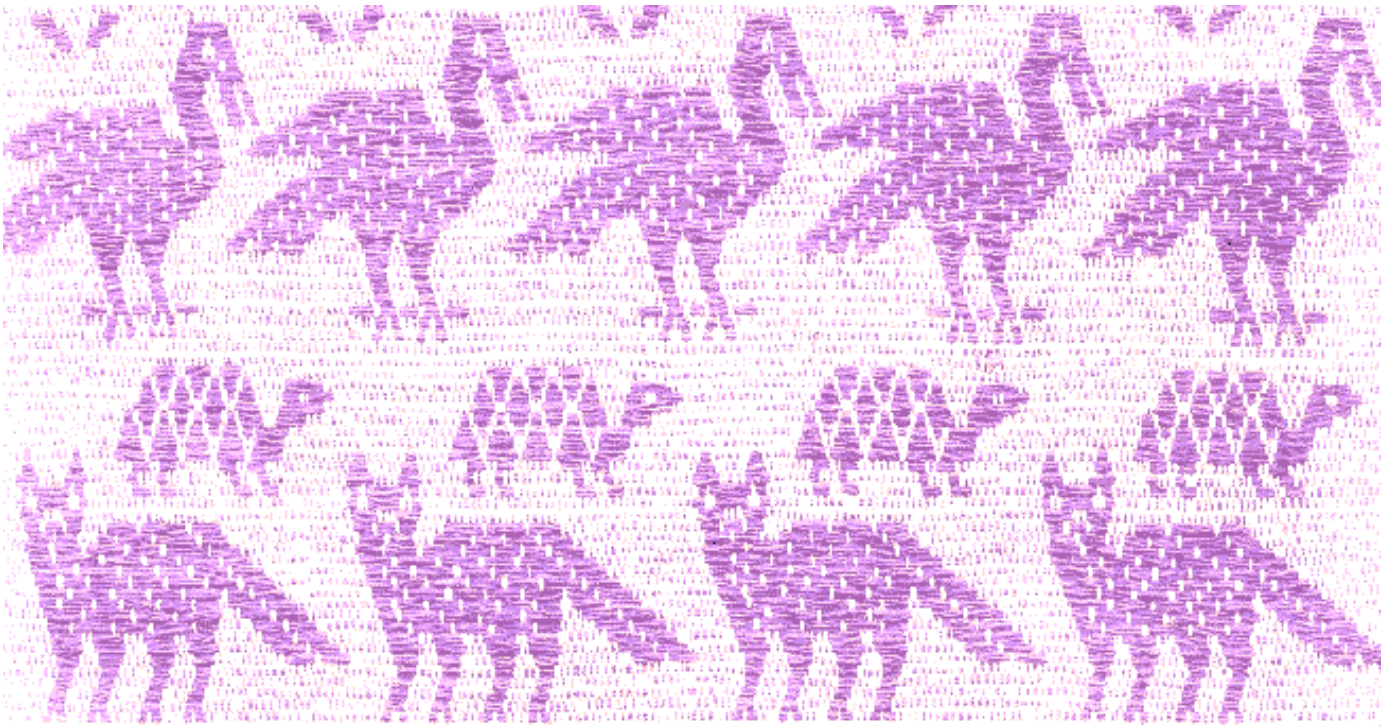
The backstrap loom is a very ancient type of weaving device. Although this loom may pre-date history, it is still in use today. In primitive societies it provides a weaving device at very little cost. Even in the more advanced countries it is used. It is very portable. It can be set up and used almost anywhere.

The primary feature of the backstrap loom is that the lengthwise threads (**warp**) are stretched from a fixed device such as a post or tree to a belt that a person wears around their waist. By backing away from the post or tree, the user can pull the warp threads into tension. In order to weave, the threads must be stretched in a horizontal direction and a means must be provided so that the threads can be separated into two (or more) parts so that a **weft** thread can be passed between the two sets of threads. The two sets of warp threads can then be reversed and a weft thread passed through again. By repeating this process, fabric can be woven.

The device most often used to stretch the threads sideways and to provide a method of separating them into two parts is called a **rigid heddle**. A rigid heddle is a device consisting of slots and vertical members that have a hole in their center. Half of the threads (usually first, third, fifth, etc.) are passed through the holes and the other half (usually second, fourth, sixth, etc.) are passed through the slots. When the warp is under tension, the rigid heddle stretches the warp horizontally; the weaver then moves the heddle up or down to separate the threads vertically forming what is called a **shed**. The weaver moves the rigid heddle up, passes a weft thread through, then moves it down and again passes the weft thread through. A length of weft thread is usually wound on a **shuttle** to make it easy to pass the thread through the shed. The shuttle can be something as simple as a flat board with the thread wrapped around it from end to end. When weaving, the weft threads need to be packed tightly into the warp. This is done with a **beater**. For backstrap weaving, the beater may be something as simple as a stick, but something like a comb is better.

The weaver opens one shed, passes the shuttle containing weft thread through; then the alternate shed is opened and the previous piece of weft thread is packed down using the beater. Then the shuttle may be passed through, the shed changed, etc.

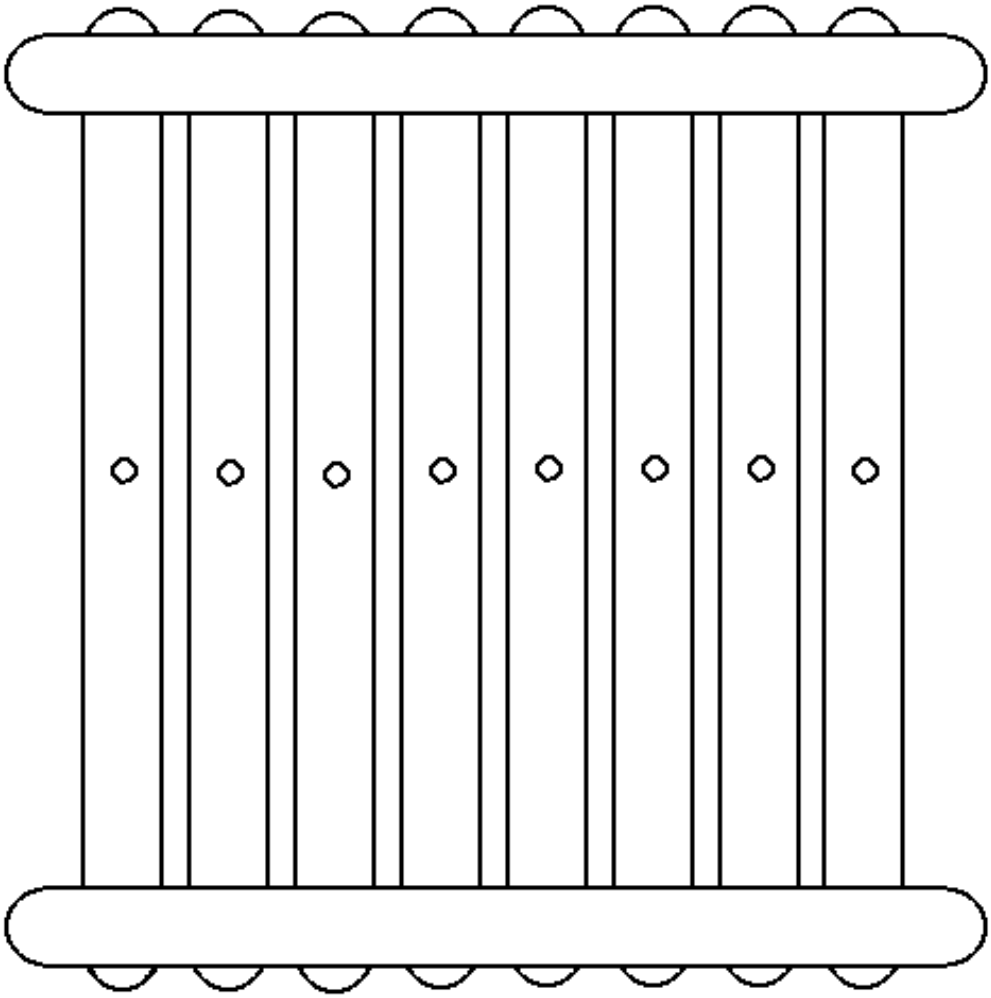
There are some limitations to back strap weaving. It is difficult to weave a very long piece of fabric. The fabric cannot be very wide. Despite these limitations, some primitive people weave beautiful cloth. Some African garments are assembled from narrow pieces of fabric that were woven on a backstrap loom. The following illustration is some cloth made in Mexico on a backstrap loom.



In this example additional techniques were used to make the figures.

MAKING YOUR OWN BACKSTRAP LOOM

The purpose of this page is to instruct you on making your own backstrap loom. First, you must have a rigid heddle. Although rigid heddles may be purchased, we will show you how to make your own. The following drawing shows a rigid heddle made from "popsickle sticks." These "popsickle sticks" can often be found in craft stores where they are called craft sticks.

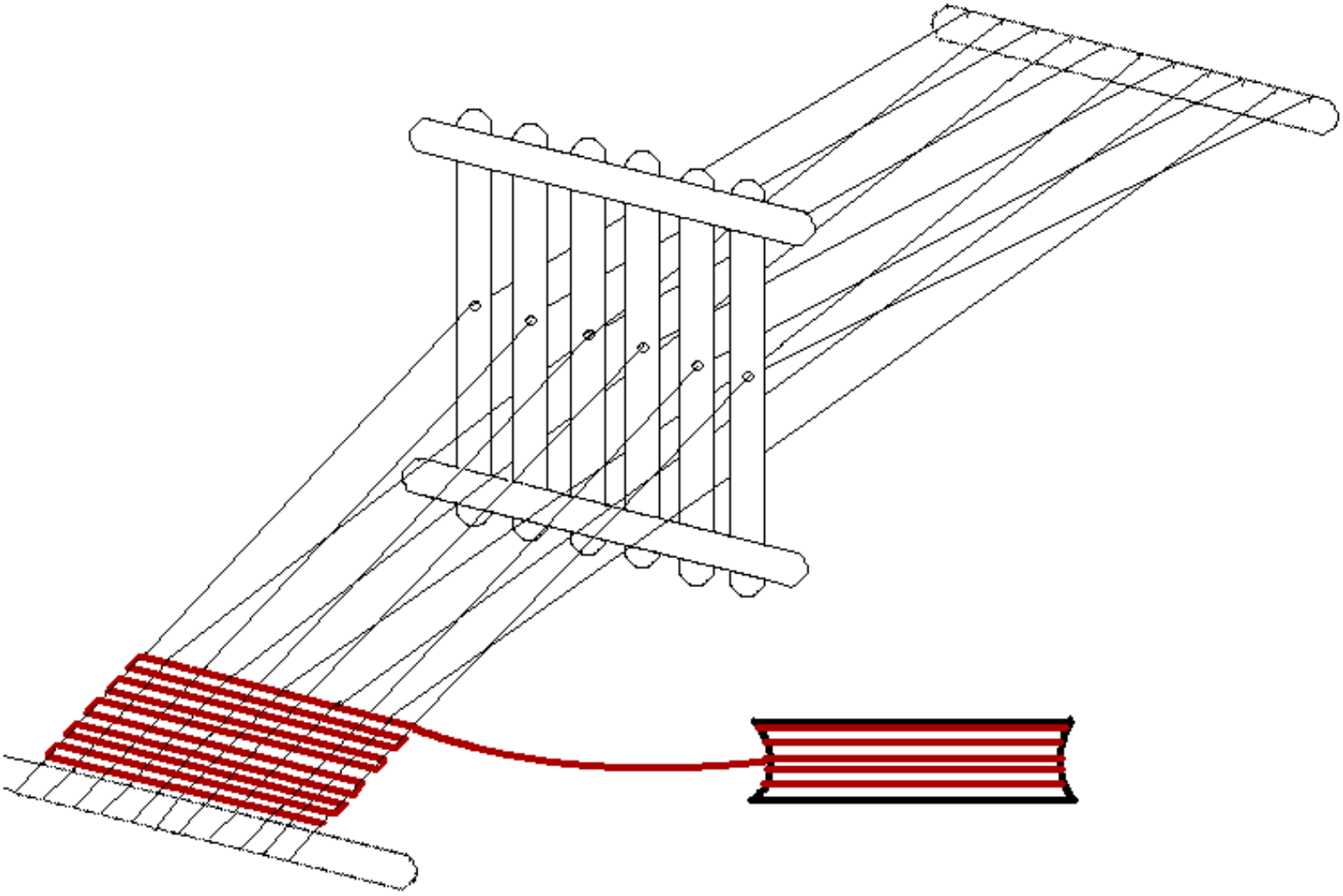


In the diagram shown, only 15 warp threads may be used. Eight of the threads go through the holes and seven threads go through the slots. This is the largest rigid heddle you can make using only craft sticks. A craft stick is glued to the top and bottom of the vertical sticks to make a rigid structure. It is a good idea to glue a stick to both the front and the back to give added strength. Some people also bind each joint with yarn for even more strength.

If you want to make a wider rigid heddle, you will have to use something other than a craft stick at the top and bottom to hold the vertical members. Any thin piece of wood may be used. However, you may not have suitable wood on hand. A suitable source of wood is a narrow piece called "screen stop." This is usually available at hardware stores or lumber yards. Some stores carry thin strips with embossed decorations that will make your rigid heddle more attractive.

SETTING UP THE LOOM

The ends of the warp threads may be tied together or they may be distributed along a stick. The stick at one end is tied to a post and the other stick is tied to a belt around the weaver's waist. A threaded loom with a shed partially opened will look something like the following picture.



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