

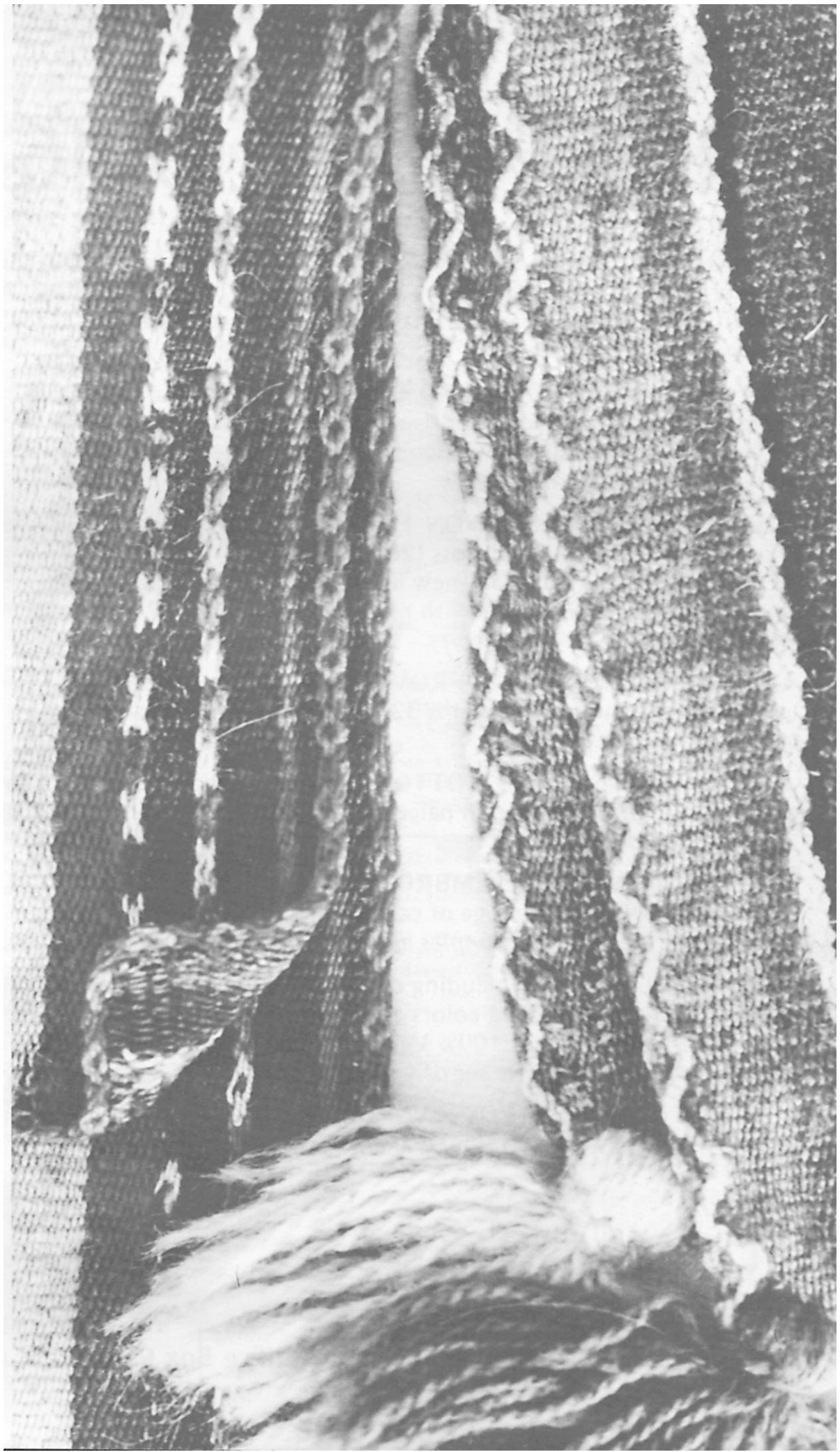
# The Weaver's Journal

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APRIL 1978

VOLUME II NUMBER 4

ISSUE 8



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# The Weaver's Journal

Quarterly Journal For Textile Craftsmen  
Volume II, Number 4, Issue 8

April, 1978

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Cover Photo: Two Crossed-Warp Edgings. Photo by Adele Cahlander.

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Free one-year subscription or renewal to your guild in exchange for nine subscription years from your members (new or renewal) mailed in one envelope, accompanied by full payment.

## Letter From the Editor

We are truly grateful to all the wonderful readers who complimented us for the January, 1978 issue. We need this kind of feedback to be able to publish a journal that pleases as many of you as possible.

The July, 1978 issue will center around "Weaving for Interiors" - you will find ideas for upholstery fabric, draperies, wallhangings, bedspreads, rugs, household linens and more. If any of you have woven successful projects for "Interiors" and want to share your experience with others, we encourage you to submit your ideas to *The Weaver's Journal*. You may either write about it yourself or submit a sample and specifications to us and we will write it up. We like black and white photos of interiors where handwoven fabrics are used extensively.

The October issue of *The Weaver's Journal* will feature silk. Here again, we invite you to share your experiences.

Also, remember that *The Weaver's Journal* is published in Boulder, Colorado, not far from Fort Collins where many of you will come for Convergence '78. Part of our facilities is a weaving studio where classes and workshops will be held.

Irene Waller will give a workshop here on July 5, 6, 7 on "How to be a Productive Weaver". Gail Rutter Van Slyke is scheduled for later this Summer.

For class and workshop information send a SASE to "The Weaver's Journal".

We urge you to participate in our "Holder of Hotpots" show and to come and visit us on June 18 - July 2, when all the entries will be displayed.



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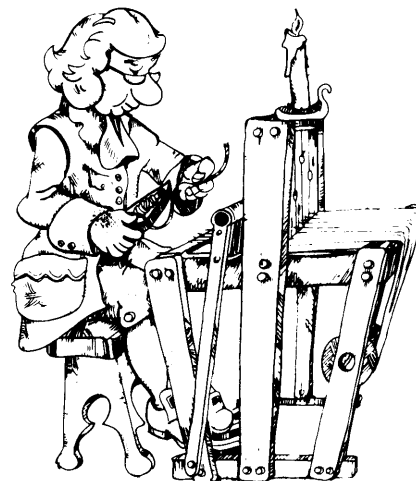
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Plate 1 - Scott and Jennifer Knollenberg model scarves woven by Jeanne Richards

# Accessories

## Children's Scarves

Boundweave lends itself to whimsical patterns suitable for decorating children's clothing. The main part of the garment is usually woven in a balanced plain weave while the border designs are woven in the much heavier weft face boundweave. Each one of the two scarves has a border design of reindeer. The other end is decorated with a band of girls or a band of boys.

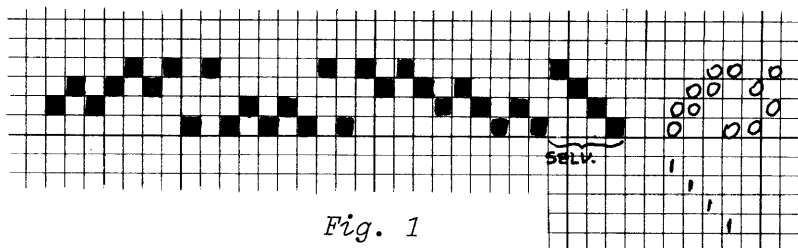


Fig. 1

WARP: Maypole, 2 ply wool worsted from Oregon Worsted Co.  
WEFT: Tabby: same as warp.

Pattern: 1 ply reindeer yarn, and Aberdeen 2 ply wool.

THREADING, TREADLING AND TIE-UP: see Fig. 1.

SETT: 15 e.p.i. (60/10 cm) single sleyed.

WIDTH IN THE REED: 12" (30 cm). After washing, 10 3/4" (28 cm).

LENGTH ON THE LOOM: 54" (137 cm) without fringe. After washing - 48 3/4" (124 cm) plus fringe.

BODY OF SCARF: Tabby.

PATTERN ENDS: Boundweave. Reference: "The Weaver's Journal" Vol. I No. 4, p. 5.



Plate 2 - Handwoven bag  
Origin unknown

## Drawstring Bag

The bag illustrated in Plate 2 is made from an oblong piece of woven material 20" (51 cm) long and 11" (28 cm) wide. The lining should be 18" (46 cm) long and 11" (28 cm) wide.

Weaving the cloth:

WARP: carpet warp

WEFT: 4 ply worsted. For the pattern bands the worsted wool was plied with a thin bright effect yarn.

THREADING, TIE-UP AND TREADLING: predominantly weft-face plain weave.

WIDTH IN THE REED: 12" (30 cm).

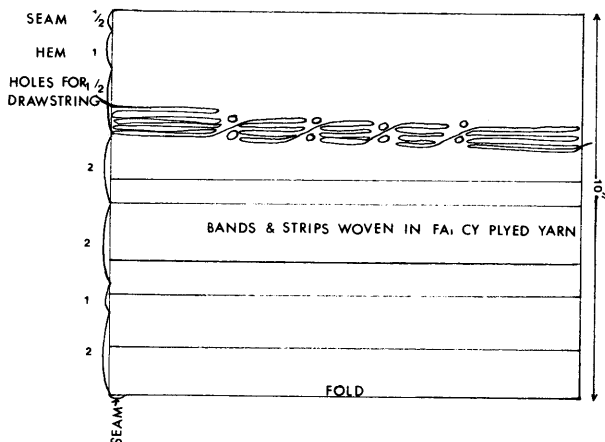


Fig. 2

Fig. 2 illustrates half of the cloth. Note that the holes for the drawstring are made by weaving a pick of Spanish weave.

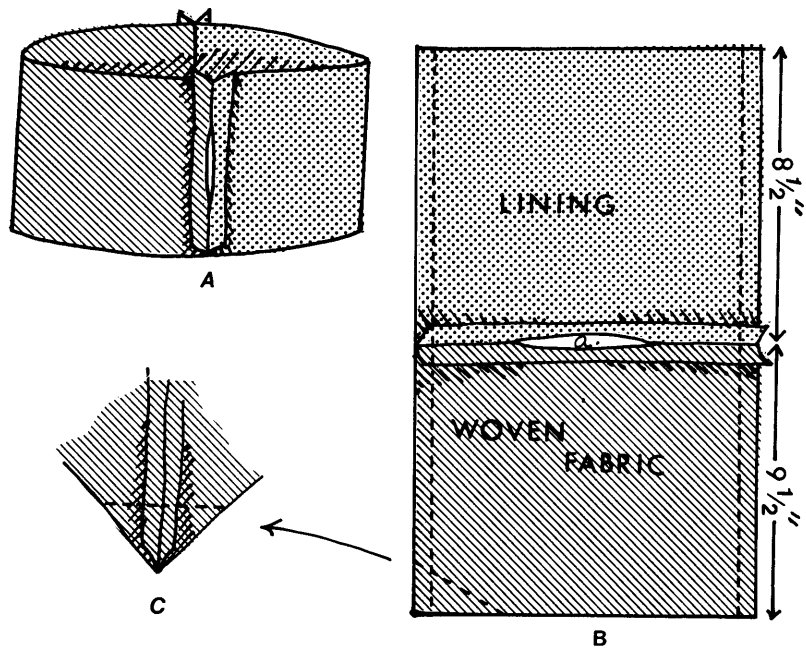


Fig. 3

Fig. 3 illustrates the steps of making the bag.

A - lining and cloth are sewn together to form a ring. An opening is left for turning the bag inside out.

B - sew the side seams.

C - pinch each corner and sew across.

Turn bag inside out and stitch the slit "a" together.

Two 24" (61 cm) long cords are threaded through the holes produced by the Spanish weave as shown in Fig. 4. The cords are knotted together on opposite sides of the bag.

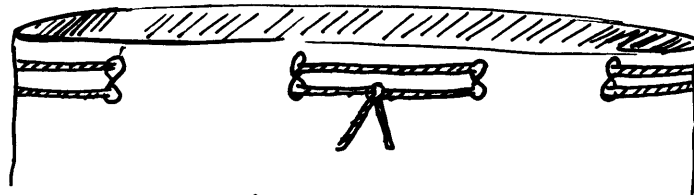


Fig. 4

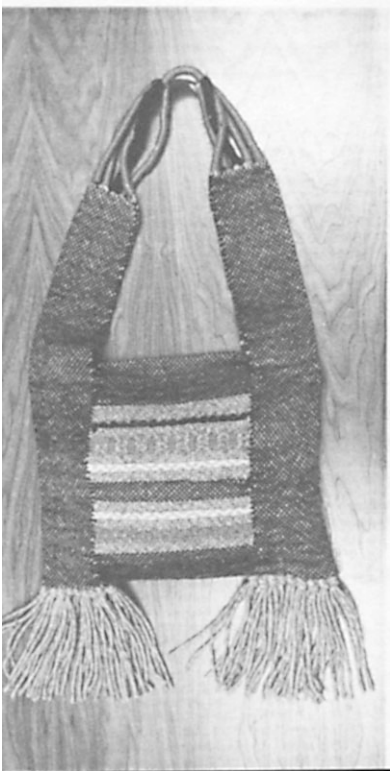
## Large Bags Made From Narrow Strips

The smallest 4 harness loom is adequate for this roomy bag. A two harness loom is suitable too. The designs on the bag can be made with pick-up, soumak, pile or tapestry techniques.

WARP: rug wool, natural brown blend

WEFT: black, natural brown blend for plain weave, red and white rug wool for the twill pattern picks.

Plate 3 - Bag woven  
by Doris d'Avila



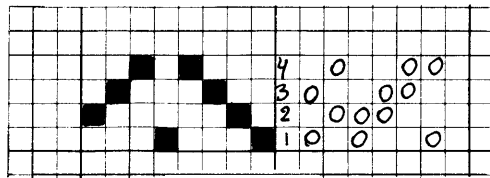


Fig. 5

SETT: 10 e.p.i. (40/10 cm).  
 THREADING: rosepath - see Fig. 5.  
 TREADLING: plain weave except in pattern areas where twill picks are woven in black, white and red.

WIDTH IN THE REED: 8" (20 cm).  
 LENGTH: see Fig. 6.

CONSTRUCTION OF THE BAG: fold the strip for the center section of the bag crosswise and fold the hem to the inside. Fold the strip for the side of the bag lengthwise. Sew the selvages of that strip to the selvages of the center part without seam allowance. Finish the fringe with overhand knots. See Fig. 7. The unwoven warp of the handle is wrapped with different colored yarns.

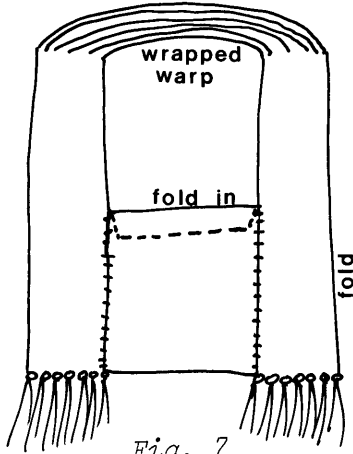


Fig. 7

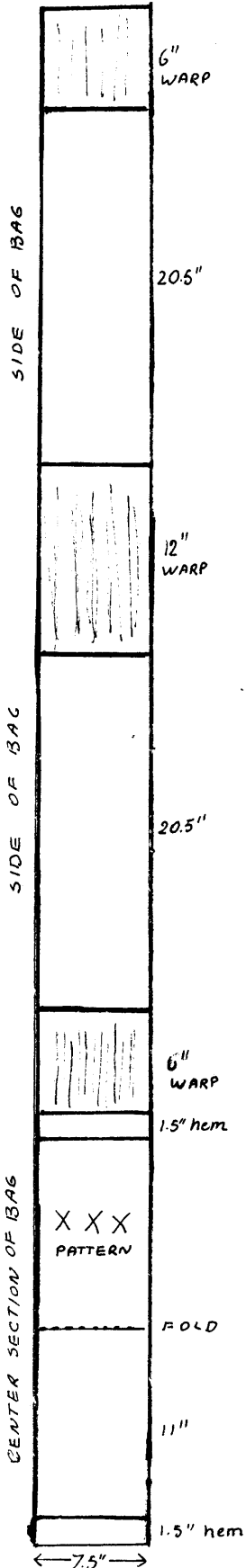


Fig. 6

## Double Woven Bag



Plate 4 Double Woven Bag woven by Willy Bottema

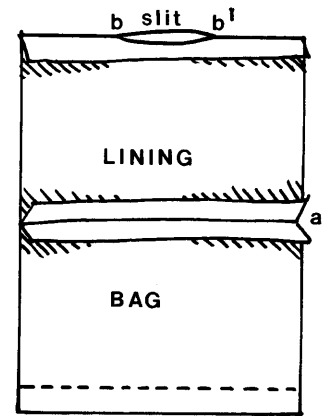


Fig. 8

The bag illustrated in Plate 4 is made with a tubular woven piece  $16\frac{1}{2}$ " (42 cm) wide and 12" (30.5 cm) long. The bag is constructed and lined as shown in Fig. 8. The lining is folded and seamed to form a tube of the same size as the woven tube. Both tubes are sewn together with seam a. The tube is closed at the bottom but an area  $bb^1$  is left unstitched at the top to turn

the bag. The 4 corners are stitched across as in the children's bag illustrated in Plate 2.

Turn bag inside out and sew a zipper at the top for closing. Attach loops of wrapped yarn or inkles, one 3½" (9 cm) and one 8½" (22 cm), in the positions shown in Fig. 9.

The bag is carried by the long loop which first passes through the short loop.

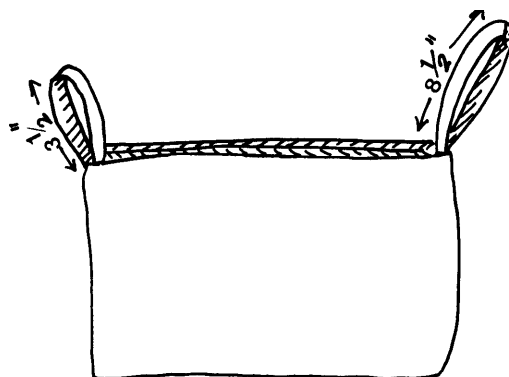


Fig. 9

## Necktie

The necktie requires a strip of weaving 5" (12.5 cm) wide and 50" (127 cm) long (after washing).

The tie illustrated in Plate 5 was woven as follows:

WARP: 2/18's wool in gray and black.  
 WEFT: fine woolens and fancy wool loop in brown, navy, beige and white.  
 THREADING, TIE-UP AND TREADLING: see Fig. 10.  
 SETT: 24 e.p.i. (100/10 cm).

The weaving is done with random weft.

The lining was cut narrower than the tie and, with right sides together, the seams were sewn on the machine. The tube was turned inside out and the ends turned in and covered with lining.

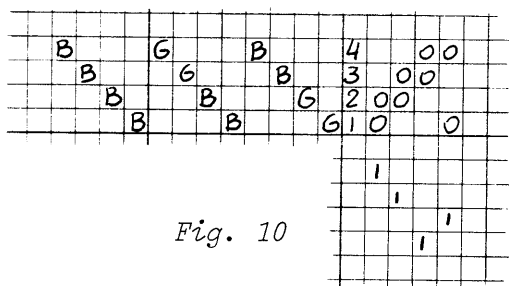


Fig. 10

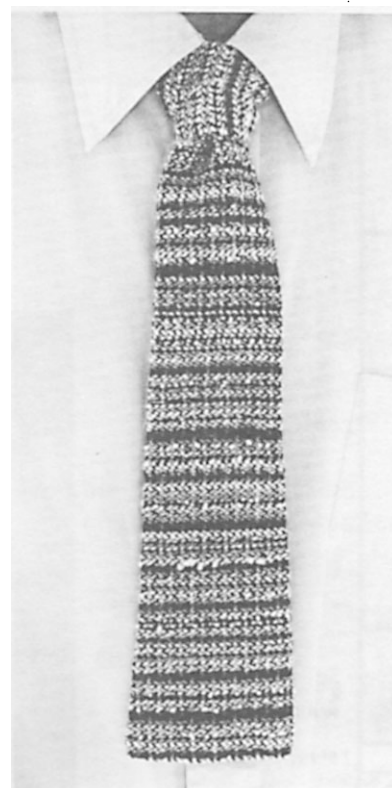


Plate 5  
 Necktie woven by  
 Maxine Wendler

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Plate 6  
Slippers woven by Mary Derr

## Hot Foot

If your feet get cold in winter, these slippers are what you need. They are woven on cardboard with a blunt nose yarn needle, using woolen yarn for both warp and weft. You will need two pieces of stiff cardboard 12" x 8" (30 x 21 cm) (not corrugated) and 2 metal curtain rings (for 5/8" (16 mm) rod).

Blow up the pattern of Fig. 11 to 3 times the size given. This can most easily be done on 6 x 6 to the inch graph paper; each square will correspond to a square in the figure. Enlarge the pattern for men's sizes and make it smaller for children. Trace the pattern on each one of the cardboard pieces. Now use the yarn needle to make a hole through each dot. Sew rings securely as indicated on the pattern.

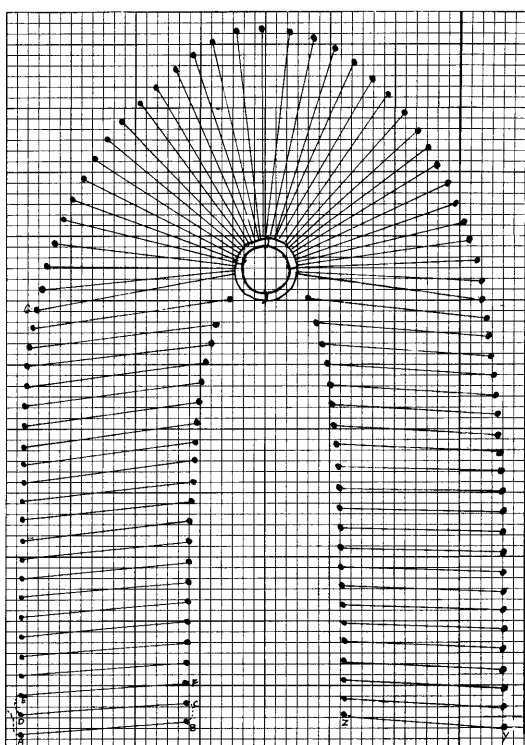


Fig. 11

Thread your needle with wool yarn suitable for warp and bring it up from the back through hole A, leaving about two inches (5 cm) of yarn free. Carry the yarn over and through hole B, up through hole C and across to D. Tie the loose end at A to the working end on the underside of the cardboard. Proceed to E crossing to F, coming up the next inside hole and across again. Repeat. When you reach G, go across to the ring and slip the yarn under and bring it over the ring for the return. Work with the ring as with the inside warp holes until you reach L, then resume the earlier method of warping. At Z, tie the yarn and leave about 2" there.

Thread the needle with wool yarn suitable for weft. Begin at Z, moving the needle under the first thread, over the next, etc., completely around the pattern to A, then return, making a simple darning stitch. Keep the weft loose as it is put through the warp, but press each row hard against the previous one. You will need to make several extra rows on the toe, near the ring, to finish the slipper. Make the second slipper in the same way.

Carefully tear the cardboard from around the slippers. (It tears easily). When they are free of cardboard, sew the back of the slippers together with yarn, A B to Z Y. Attach the slippers to soles -- Scholl's lambswool inner-soles if you want very warm slippers. Do not allow any stitches to float on the bottom of the sole, as they will wear quickly.

Add a row of chenille along the top edge of the slippers to keep your ankles warm. (See *The Weaver's Journal*, July 1976, "Braid Your Own Chenille", p. 10). It can be left looped, or the loops may be cut.

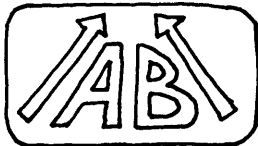


# Andean Crossed-Warp Techniques for Decorative Trims Part I - Flat Bands

by Adele Cahlander Drawings by Ann Houston

High in the Andes, some Peruvian and Bolivian Indians weave attractive narrow ties, straps, and an occasional edge-trim, with a special kind of finger manipulation. The techniques are hard to describe; at first you will feel as if you are "all thumbs". Soon, however, these bands become fun to do, and have many practical uses in various yarns, fine to coarse.

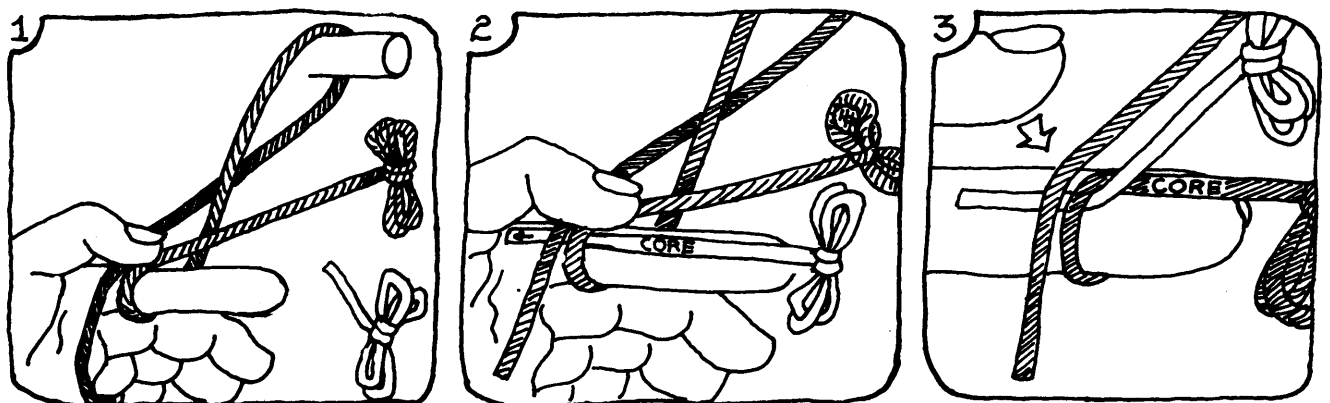
Diagonal-line designs, some very narrow and some wider, are developed by the crossing and interworking of warps in units of four. For each unit, either of two basic types of crossings is used, according to the angle in the design. To direct the line up toward the right ↗, an *A crossing* is used, while a *B crossing* is used to angle the line up toward the left ↖. The techniques will be described for a very narrow, short example with a simple zig-zag line, using only two colors of yarn.



Preparing the Warp. Wind single yarns in figure-8 bouts, first a dark (D) bout, then two light (L) bouts, and lastly another D bout: DLLD. The figures-of-8 can be wound very simply around your left forefinger and a small post (Fig. 1) or even around your finger and a big toe! A method for a neat beginning end will be described, adapted from video tapes taken by Elayne Zorn. Hold your left finger in a *horizontal* position, like a near beam.

To start winding the warp, hold the end of the D yarn in your left hand, securing its end around your baby finger, and using your thumb to keep it in place on your left forefinger. Wind the yarn in a figure-8 bout, returning under your left finger and up under your thumb, leaving the yarn uncut. Put the ball down at the right, *beyond* the light ball to be used next.

Grasp the end of your L yarn and insert it toward the left, on top of and parallel to your left finger, under the D yarn, as a *color core*. (Later bands will use more colored yarns for this core.) With your left thumb holding the yarns firmly in place on your left finger, lift the L ball from the *near* side of the D ball, to start it in the direction of making a figure-8 bout. At the same time, adjust the *holding turn* on your left finger, by pulling the D yarn snugly toward the right on your finger, to become the core yarn. (Fig. 3)



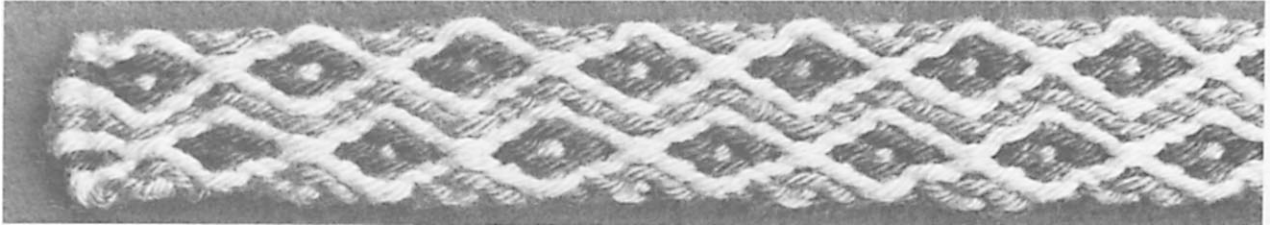


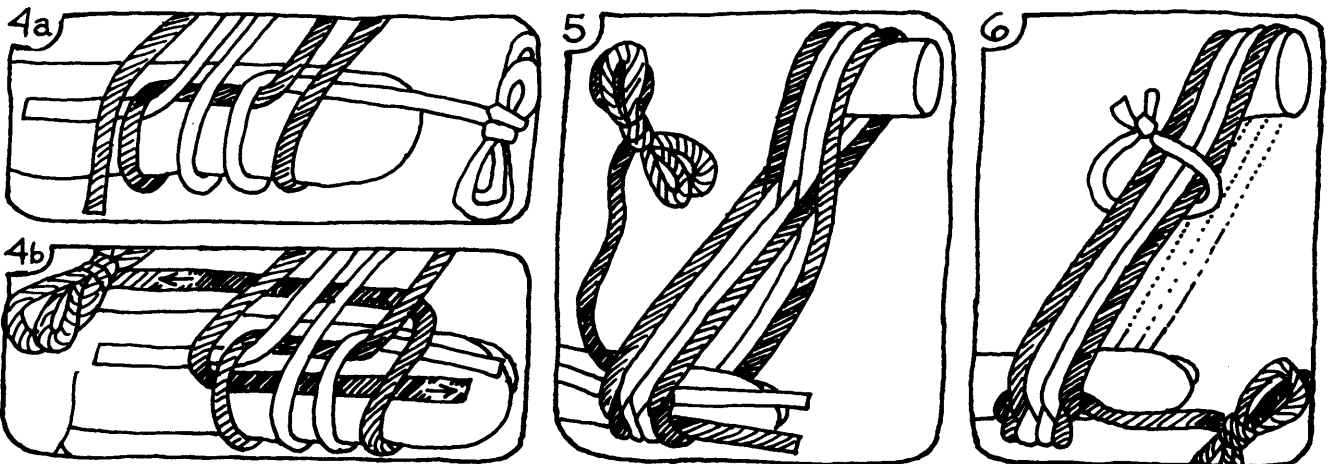
Plate 1. Narrow crossed-warp band used for first project, 4 bouts (8 warps).

Plate 2. Wider version, with 16 figure-8 bouts, or 32 warp ends.

To make the holding turns properly, it is important each time to put the last-used yarn down at the right on the *far* side of the yarn(s) being used in the color core. The yarn for the next bout must then be picked up on the *near* side of it to make the turn. On each return from the far post, pass the yarn *under* the core yarn extending out from your finger.

Wind two figure-8 bouts with the L yarn, and place the L ball at the right beyond the D core yarn. Make another holding turn, and wind the final D bout. Cut the D yarn, leaving about a yard to be used as *weft*. In the shed held open by your finger, pass the beginning and final D ends in opposite directions, and pull snug. Cut the L yarn, leaving an inch to trim later. (Fig. 4b)

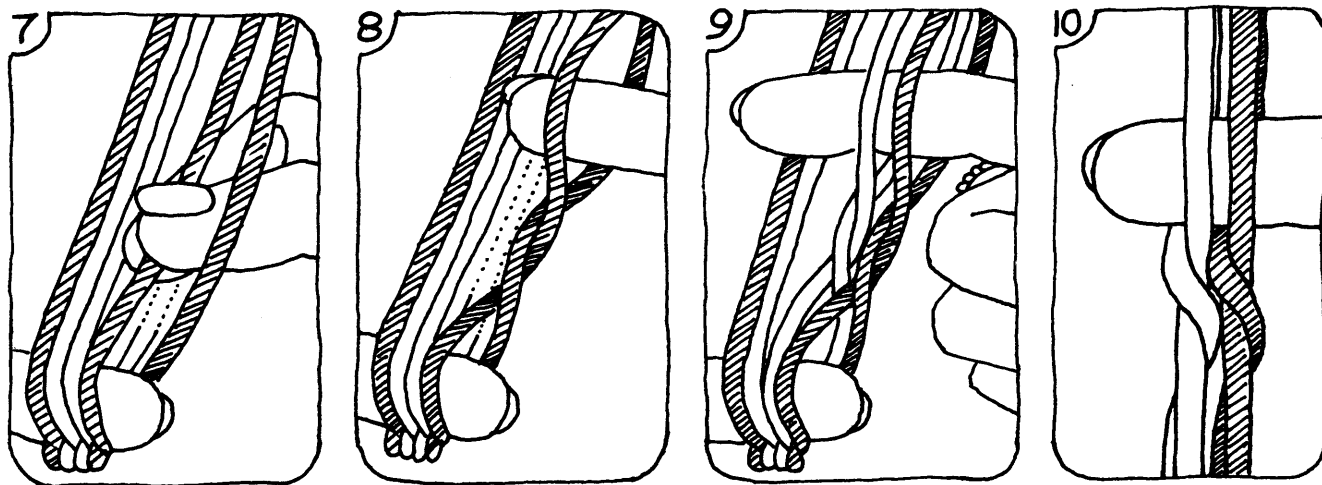
Now look at your warp. The figure-8 winding has made a warp cross near the middle (Fig. 5). Using your right hand, lift the warps from the far side of the warp cross, carefully removing your left finger from the shed so that you can firmly beat down in this new shed, which will hold your weft and ends neatly in place. Pass your weft to the right (→) and pull it snug (Fig. 6). Use a cord or doubled piece of yarn to tie a *shed loop* around the yarns that are now in the top layer. (You may tie the far end to a post.) With your left finger *in the shed with the weft*, you are now ready to start the crossings.



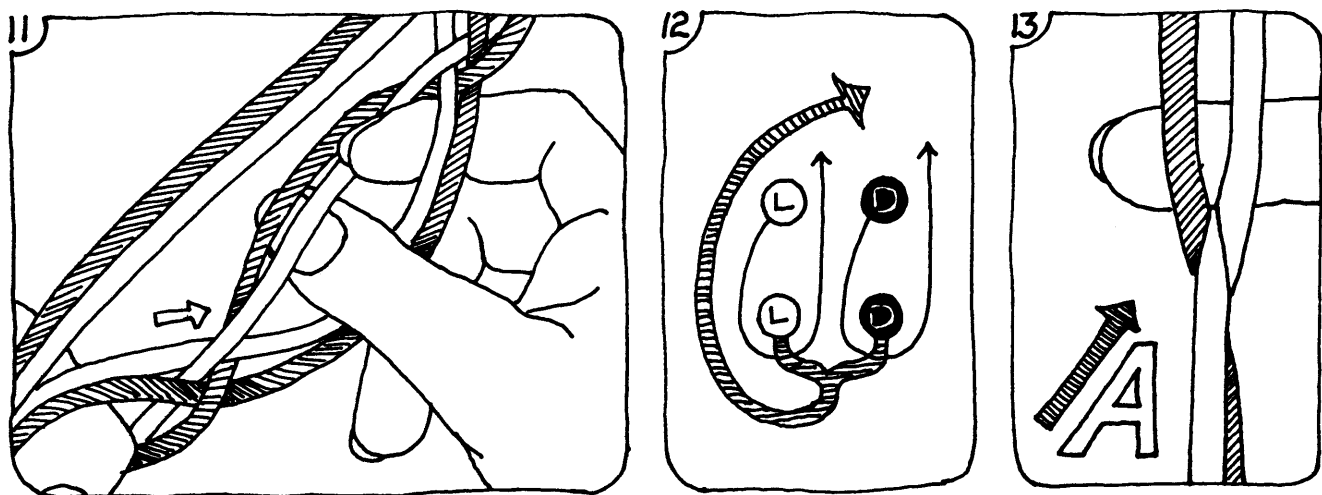
## "A" Crossing

With your left forefinger in the shed with the weft, check that your warps are lined up DLLD, both above and below your finger, so that you have four *vertical pairs*, in that order. Each crossing unit is composed of two vertical pairs (four warps). Your first row will have two 4-warp units, each with A crossings, which can be represented as AA.

A cross, step 1. From underneath, reach past the lower right warp to grasp the upper right warp (Fig. 7), then bring it around and back up to the top (Fig. 8). Repeat with the second vertical pair, and hold these new top warps together temporarily on your right forefinger (Fig. 9). Under tension, your two pairs of warps should look like Fig. 10.



A cross, step 2. With the back of your right thumb, reach down at the *left* of the 4-warp unit to lift the *lower partners* (Fig. 11) and keep them instead of the others. This will partly untwist the yarns, changing their warp order and giving them the "A" angle (Fig. 13). Store these *keepers* on a lower finger of your right hand, to be out of the way for the next unit's manipulation.

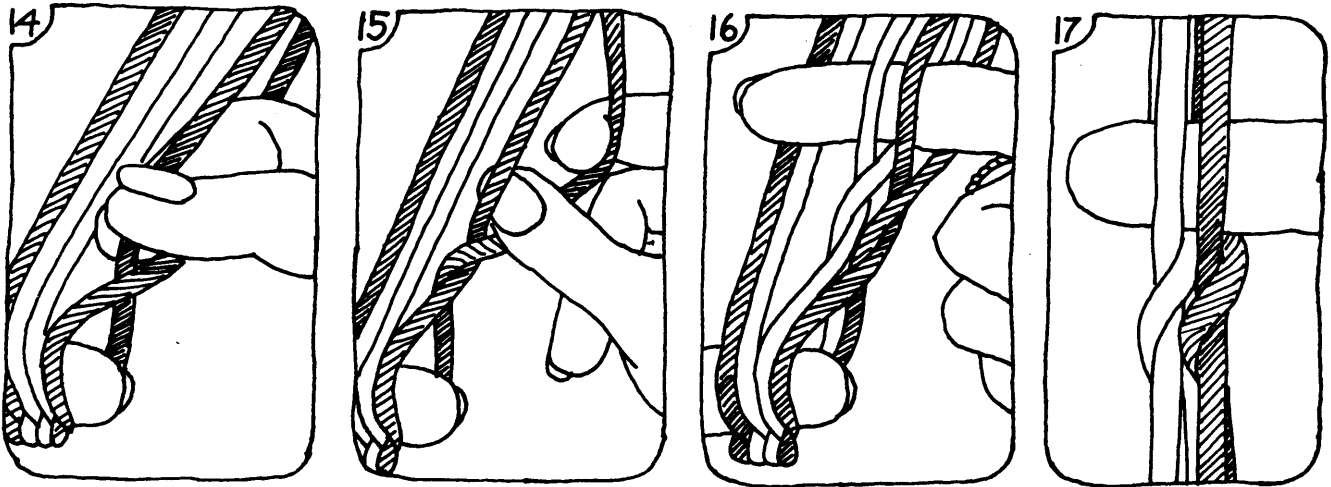


REPEAT the same two-step procedure with the other two vertical pairs of warps, to make another A crossing. Pass the weft to the left (←) and beat. For Row 2, merely lift the shed loop, pass the weft to the right (→) and beat.

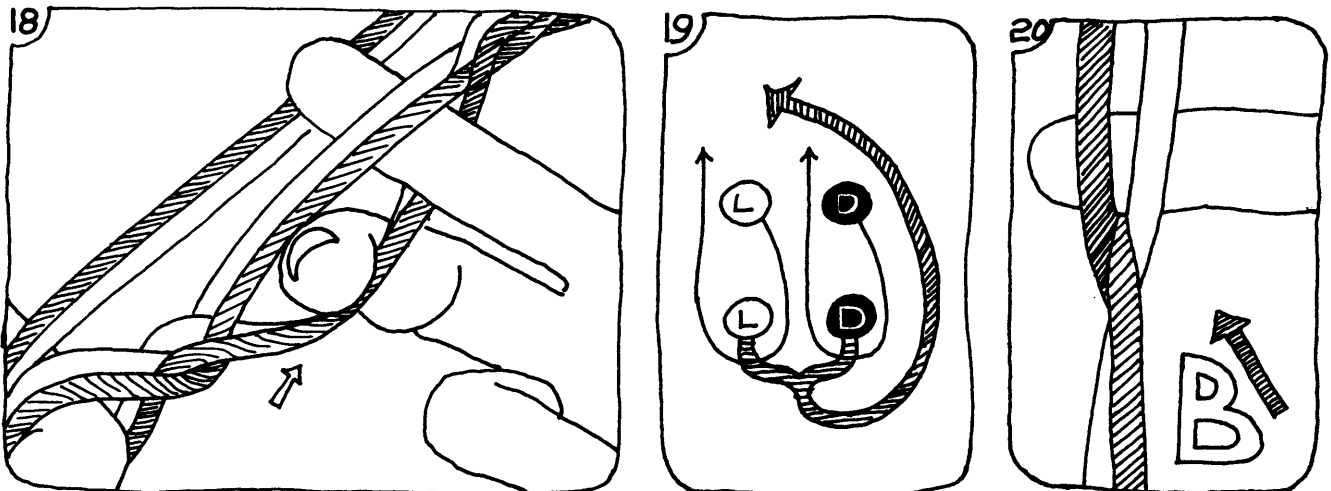
## "B" Crossing

With your left finger in the shed with the weft, again check that your warps are lined up DLLD, above and below your finger. For Row 3, the two units each have B crossings, represented as BB.

B cross, step 1. Move the upper right warp slightly toward the right on your finger. At its left, reach down to grasp the lower right warp (Fig. 14), lift it up, pulling it toward the right, so that you can lift *its partner* with the back of your right thumb (Fig. 15), to take and hold temporarily. Repeat with the second vertical pair (Fig. 16). Under tension, these warps should look like Fig. 17.



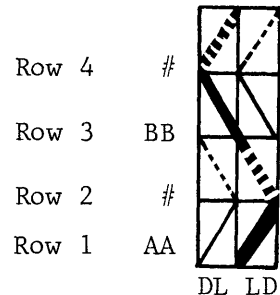
B cross, step 2. Reach down at the *right* of the group with your right middle finger to grasp the *lower partners* (Fig. 18) to keep instead of the others. This partial untwisting will give them the "B" angle, as shown in Fig. 20. Store these *keepers*.



REPEAT the same two-step procedure with the other two vertical pairs of warps, to make another B crossing. Pass the weft to the left (←) and beat. For Row 4, merely lift the shed loop, pass the weft to the right (→) and beat.

### Pattern Diagram

This four-row sequence can be drawn on a rectangular grid as a pattern diagram. The warping order is shown below, a code-letter for each figure-8 bout. (L, M, D) Solid diagonal lines show the A and B crossings, and the return shot from lifting the shed loop (#) is drawn with a dotted line.



### VARIATIONS

When you are familiar with the A and B crossings, and have done several inches of the zig-zag line, you can try another pattern on the same warp. It has small diamonds and small X's alternately.

In Row 1, you start at the lower right, doing the A crossing first, then the B crossing. Try weaving with a weft of contrasting color.

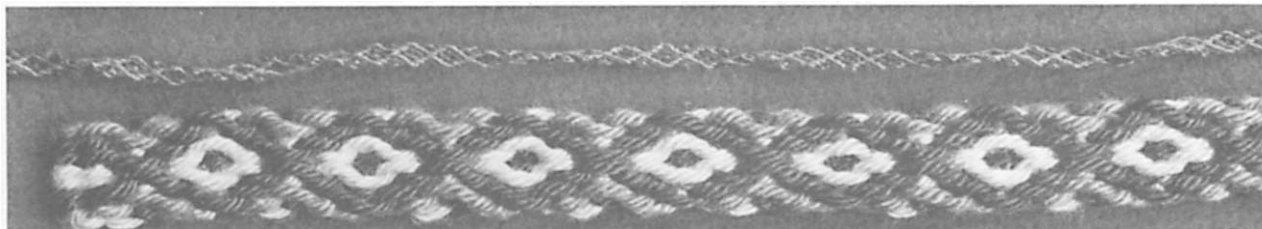
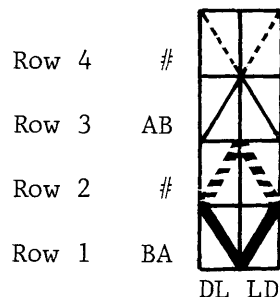


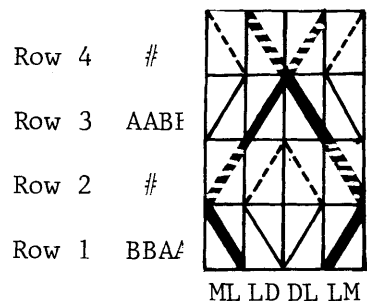
Plate 3. Diamond design in tiny Bolivian tie, and a replica in Kentucky yarn.

### 8-Bout Designs

If you wind an 8-bout warp with three or four colors, you have a choice of more designs. The most popular motif is the diamond design, which is like the first band's zig-zag design plus its mirror image, but usually with three colors instead of two. They could be wound MLLD DLLM or MDDL LDDM. Notice how each crossed row in the diagram has two crossings in one direction, and two in the opposite direction.

When you weave, observe a key characteristic of this technique: the widest part of the diamond on the face is not in front of the widest part on the reverse side.

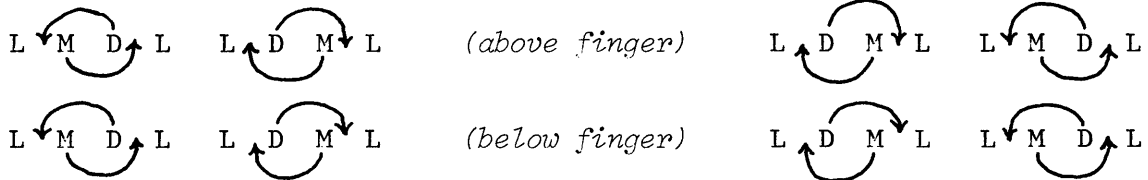
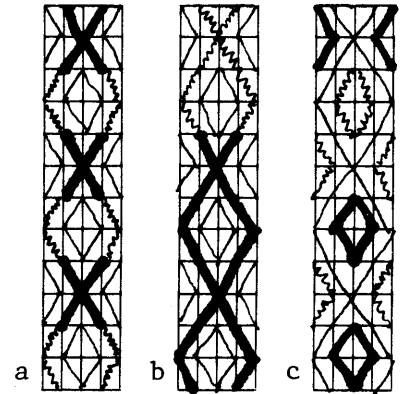
You may vary the crossing combinations on the same warp, to be BABA and ABAB, or ABBA and BAAB. Another alternative is to have other warps, using for example, MWWM DLLD for the former, and MLLM MDDM for the latter. A related band, with 16 bouts instead of eight, was seen as a strap on a coca bag. The warp order was MLLD DLLM MLLD DLLM, and the crossings were BBAA AABB and AABB BBAA, for Rows 1 & 3.



Preparing the Warp. With more colors of warp, there are more yarns in the *color core*. After the first bout is wound in a figure-8, insert *under* its two strands (on your left forefinger) the ends of *all* the other colors of yarn to be used.. Arrange them on top of and parallel to your left finger, with their balls on the *near* side of the first ball. Lift the yarn for the next bout, and adjust the *holding turn*. Continue on as before.

**COLOR SHIFTS.** A more interesting variation of the popular diamond design has shifts in the color of the connected-diamond lines (b), or more rarely, they stay the same, and the color of the centers and edge sections change (c). In these diagrams, return shots are not dotted. Since these shifts are more difficult, master simple diamonds before trying them.

The warp order is important. Use LMDL LDML for a diamond-change band (b). Follow the usual crossing sequence for connected diamonds, and you will get the effect shown in view a, with the diamond lines dark in the center and medium at the edges. To keep the color from changing in this way after a return shot, the D & M warps must be exchanged in each layer, as shown in the diagrams below. Here, D lines are to be kept on the face, so D warps are moved *over* M warps in each layer. Similar adjustments are needed to keep the M warps on the face. Check the reverse side frequently, to be sure you are doing the exchanges and crossings properly.



*(above finger)*  
*(below finger)*  
 Dark lines to angle OUT (on Face)

*(above finger)*  
*(below finger)*  
 Dark lines to angle IN (on Face)

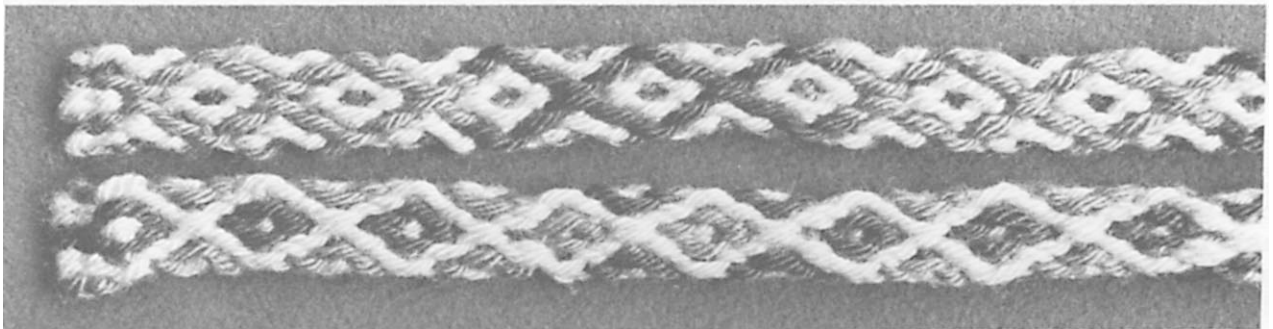
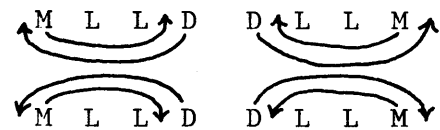


Plate 4. Bands with color shifts: above, in lines of diamonds; and below, in the center and edge, or background.

The second type has light diamond lines with changes in their background (c). The warp order is MLLD DLLM for dark centers. The M & D warps are exchanged after a return shot to change the centers to medium. Cross them *within* the shed, passing the M warps *above* the D's in the upper layer, but *below* the D's in the lower layer. You may continue without exchanging until you want to have D centers again. Then you reverse this process, passing D's above the M's in upper layer, and below M's in lower layer, in shed.



Changing diamond center, D to M

Reserved Sheds. Two wider examples will be given. The first comes from a Bolivian chevron design that had me really puzzled for a while. The second, a sun motif, was developed by British weaver Robin Woodhouse "by mistake," he said. For both, the return shots are not done until after at least four rows of crossings have been done consecutively. Some means is used to reserve or store them in the back of the warp, to be used later for a series of the return shots.

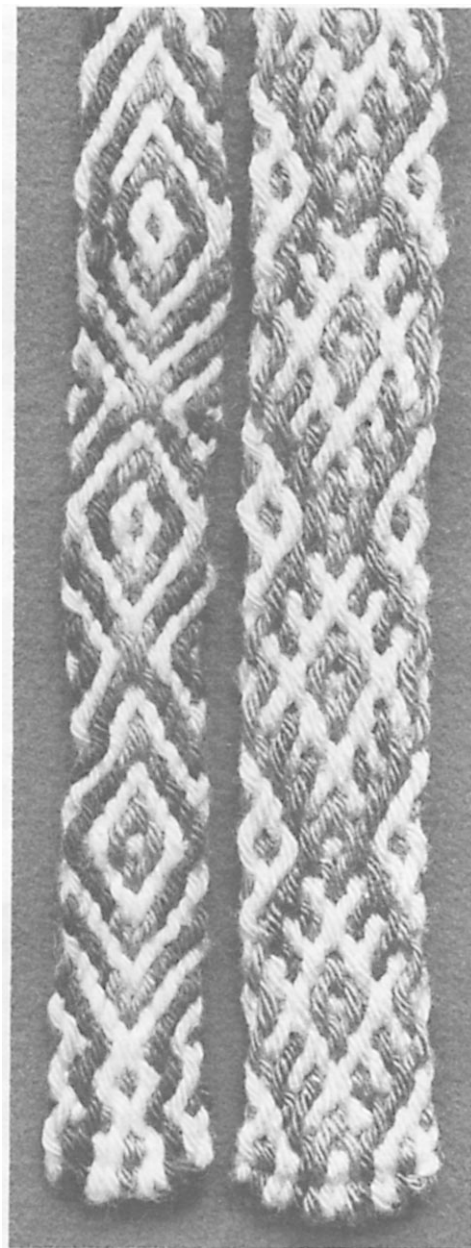
For the chevron, wind 12 bouts, using two shades of light warps, yellow (Y) and white (W); a medium; and two shades of dark (D,D'). The warp is wound YDDWWM MWWD'D'Y.

For Row 1, make the following crossings: BBB AAA. Pass the weft, and insert something to hold this shed toward the back, just in front of the shedloop. A rag strip works well, some use metal clips or safety pins. There is no return shot now. The warp order has shifted to DYWDMW WMD'WYD'. Leave it that way to do the same BBB AAA crossings for Row 2. Again store the shed, pass the weft, then do Row 3 like Row 1, and Row 4 like Row 2. You may then start on your "free ride", because for three weft passes, the stored sheds are brought down in turn, and for the fourth, the shed loop is used. This 8-row sequence may be repeated indefinitely, or it may be varied at will, as it was in the Bolivian band.

For the sun, wind the warp as 16 bouts: LMDL LDML LMDL LDML. Install the shed loop beyond the warp cross. Four rows of crossings are made, as listed below. For each row, the weft is passed, with the sheds for Rows 1, 2 & 3 stored in back as for the chevron. After Row 4 is done, each stored shed is brought down in turn, with the shed loop last. Repeat for the next 8 rows, etc.

It is important before each row of crossings to be sure the warps are in proper order. Because of the crossings, the order for the even rows is different from that for the odd rows:

Warp Order:	LMDL LDML LMDL LDML	
		MLLD DLLM MLLD DLLM
	LMDL LDML LMDL LDML	
		MLLD DLLM MLLD DLLM



*Plate 5. Chevron and sun motifs woven in bands with reserved sheds.*

Row 1.	ABBA BAAB
Row 2.	BBAA BBAA
Row 3.	BAAB ABBA
Row 4.	AABB AABB

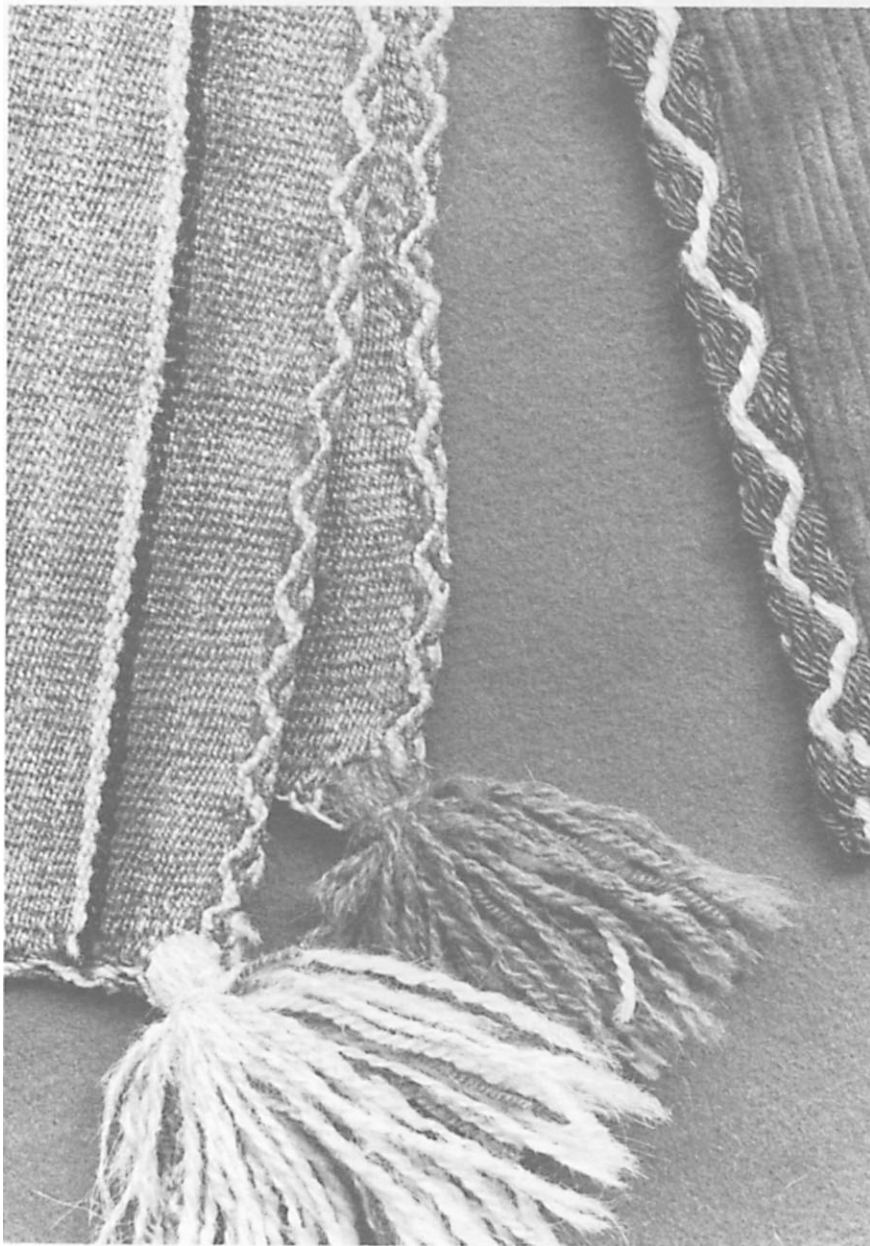


Except for Robin's sun, I have identified all these variations in Bolivian examples. After our book on Bolivian weaving had gone to press, friends of Nancy Castle told me of what she had learned from the Indians in Peru, and I was able to make improvements on my basic techniques. Nancy has described the technique in an article to appear in the 1977 Textile Museum Journal.

#### A Decorative Flat-Woven Edge Trim

In the area of Lake Titicaca, a crossed-warp band is occasionally used as an edge trim for a small carrying cloth or a shoulder shawl. It is a flat band, extending out beyond the selvedge of the fabric, and joined to the fabric edge by means of its own weft, threaded on a needle

In this band, the weft is passed to the right and to the left as usual (in contrast to the tubular edge-binding described in the April '77 *Weaver's Journal*, which had a spiralling weft).



*Plate 6.*

*Flat crossed-warp edge trimmings "with zig-zag line".*

*Left, Bolivian 4-bout edging*

*Right, Replica of 6-bout edging*

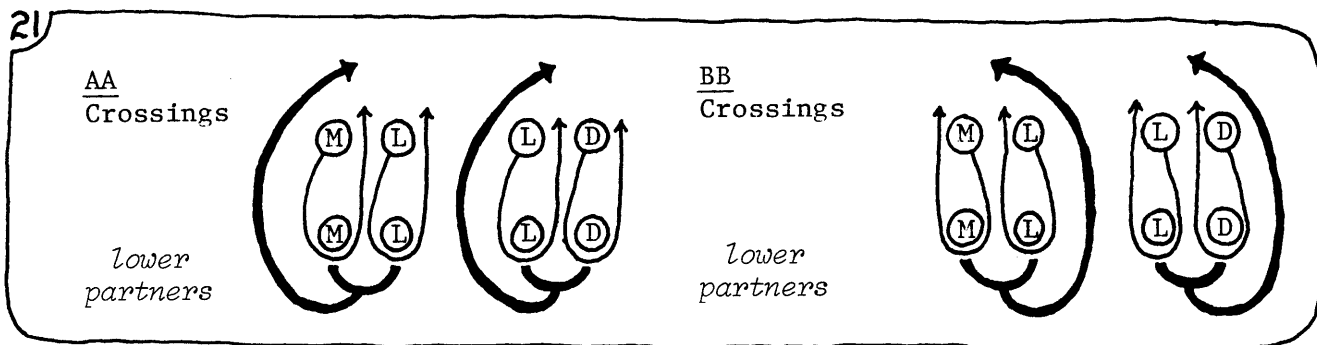
Three variations have come to my attention. Two are narrow, 4-bout bands like the first two in this article - a zig-zag line in one, and small diamonds in the other. The third was described in a letter from Robin Woodhouse of England. It has a zig-zag line, but has six bouts, with a special way of doubling warps at the edges.

Because of using the needle, it is more convenient to reverse the direction of the weft shots, so that the return shot is passed toward the left, with the needle point entered into the fabric edge. The left forefinger is then entered into the shed with the needle to make the row with crossings.

1. Four-Bout Crossed-Warp Edging. The edge-bouts may be the same or unlike in color, but the two center bouts must be alike, to form the zig-zag. Wind four figure-8 bouts (ML LD). You may decide to wind your bouts around two posts, merely tying the yarn ends together, making a loop to hang the knotted end from a post. You can then start weaving at the other end of your warp. Insert your left forefinger in the *unknotted* end-loops, and install the shed loop beyond the warp cross.

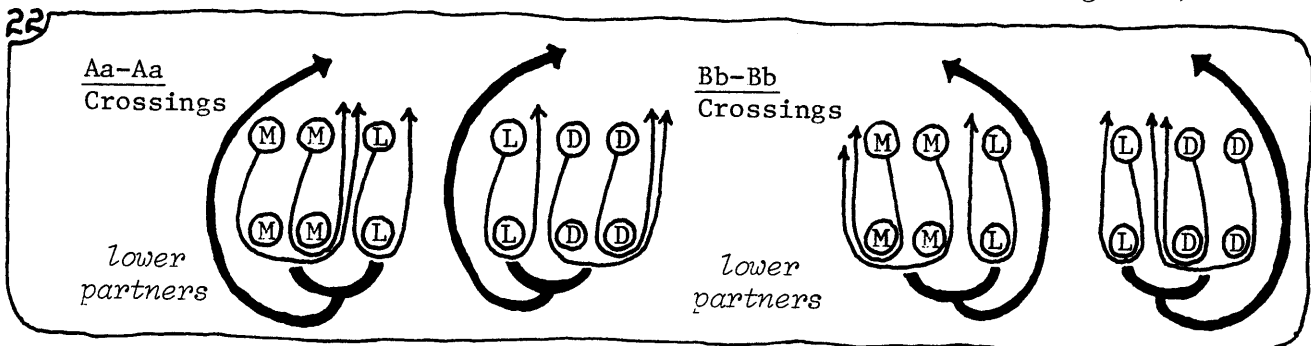
With your weft on a needle, and its end secured into the edge of the fabric, pass the weft toward the right (→) in the end-loops in place of your finger. Lift the shed loop and pass the weft back to the left (←), putting the point of the needle into the cloth edge. Enter left forefinger into shed with needle.

Weaving Sequence. Follow the 4-row sequence of the first band: cross AA, shed loop, cross BB, shed loop. The crossings are diagrammed below:



2. Six-Bout Crossed-Warp Edging. Wind the warps in six figure-8 bouts (MML LDD). Prepare the warp as suggested for the four-bout edging. Try a short separate example before weaving as an edging.

Weaving Sequence. This is a four-row sequence like the previous band, except that there is a doubling of warp at the edges, as indicated by the arrows in the diagram, for step 1. (See arrows drawn with finer lines in Fig. 22.)



Aa cross, step 1. From underneath, reach to the left of the lower right warp to grasp the upper right warp, and also to the left of the next lower warp to grasp the second upper warp; bring these two D warps together around and up to the top. Then reach from underneath to the left of the L warp to grasp the upper L warp, bring it around and up to join the two D warps, and hold the three temporarily.

Aa cross, step 2. (heavy line in diagram) With the back of the right thumb, lift up the lower partners of these warps, at the *left* of the group, and take hold of them in place of the others. Store these *keepers* on a lower finger.

Refer to the diagram to notice how these two steps are repeated, except that the doubling is last instead of first. When you have six keepers, pass the weft to the right (→) and beat. For Row 2, merely lift the shed loop, pass the weft to the left (←) and beat.

Bb cross, step 1. Move the upper two right warps slightly to the right on your finger. At the left of each D warp in turn, grasp its lower partner; holding these new D warps together, dip down the tip of your right thumb to lift up their partners to the left of them. Take hold of these temporarily in place of the others. At the left of the L warp, grasp the lower L warp, bringing it up enough to the right so you can lift its partner at the left with the tip of your thumb, to add to the two D warps.

Bb cross, step 2. (heavy line in diagram) Reach down at the *right* of these three warps with your right middle finger to grasp their lower partners, as the *keepers*. Store them for now.

Refer again to the diagram to notice how these steps are repeated, except the doubling is at the left instead of at the right (see M's). When you have six keepers, pass the weft to the right (→) and beat. For Row 4, merely lift the shed loop, pass the weft to the left (←) and beat.

### Final End Finishes

For the edge trim, the final end will probably be whipped on and cut off. A large tassel at the corner of the small carrying cloth concealed this finish.

However, for straps and ties, the final unknotted loops are usually braided after the unwoven warps become too short for manipulating the crossings. The tips of these loops may be brought together so that the beginning end may be put through, and the tie thereby snitched onto a belt, headband, or coca bag. Sometimes a cord tie is attached through these loop-tips, and sometimes they are merely tied together inconspicuously with fine yarn.

You might like to prepare two lengths of narrow crossed-warp bands to use as a cord for your scissors, snitching one to each handle. The length can then be adjusted at the back of your neck when you tie them together.

Part II, in the next issue, will describe techniques for *tubular* ties and edge-bindings, woven with crossed warps, and diverted warps.

*Adele Cahlander is the co-author of "The Art of Bolivian Highland Weaving," a Watson-Guptill publication, N.Y., N.Y., by Marjorie Cason and Adele Cahlander.*



# Atwater-Bronson Lace - TURNED

"Turning" a weave means changing the direction of the floats without otherwise changing the structure of the weave. There are two approaches to this technique:

Fabric with floats in the same direction on both sides.

The entire fabric structure is turned 90° so that the warp becomes weft and vice versa. The threads will now float in the other direction. In this case the whole draft is turned, i.e., the treadling replaces the threading and vice versa. Fabrics can be woven with some sections having floats in one direction and others having turned patterns. However, this requires a considerable increase of the number of harnesses. Reference: *The Weaver's Journal* Vol. II No. 2, pp. 26-27.

Fabrics with horizontal floats on one side and vertical floats on the reverse side.

The weave can be turned by simply changing the tie-up to its opposite. The weaver can produce a section of cloth with floats in one direction, then change the direction by using the opposite tie-up without changing the threading and treadling.

Atwater Bronson Lace on four harnesses is a two-block weave with horizontal floats on the right side of the fabric and vertical floats on the reverse. See Fig. 1a, where the wefts are shown in the diagram of the cloth structure. The design possibilities are vastly increased by having floats in both directions on the face of the fabric.

Fig. 1b shows how vertical floats can be woven in block B, in block A, or in both blocks A and B by changing the tie-up to its opposite. Fig. 1c and d show how vertical floats and horizontal floats can be woven side by side. In this case, lace is woven in both blocks A and B.

Fig. 2 illustrates a design for a fabric woven in Atwater Bronson Lace and using the technique of turned lace. The profile draft illustrates the two-block pattern. In this case the two blocks are woven separately, not in combination.

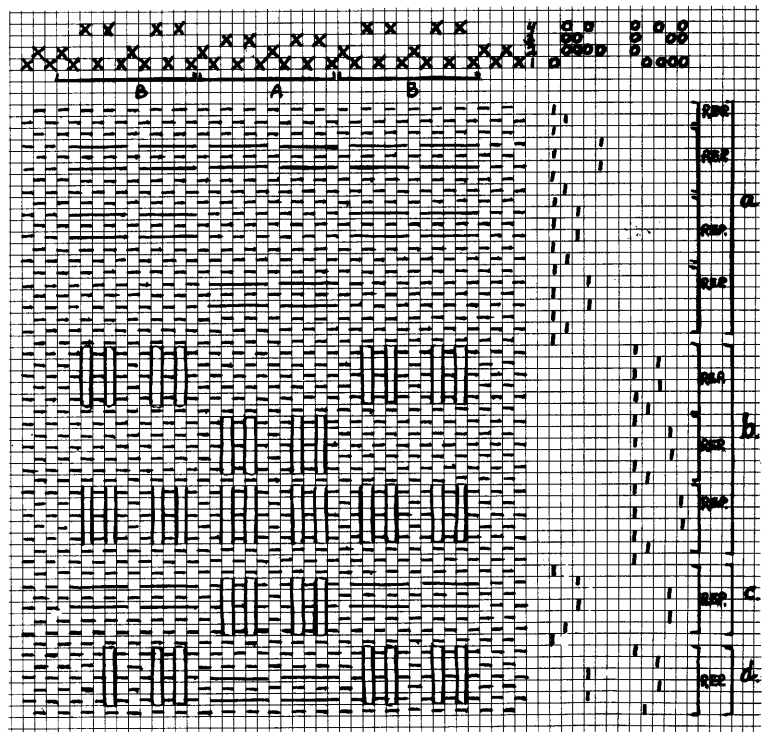


Fig. 1

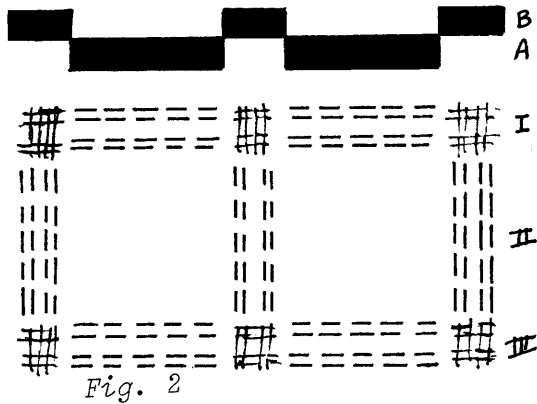


Fig. 2

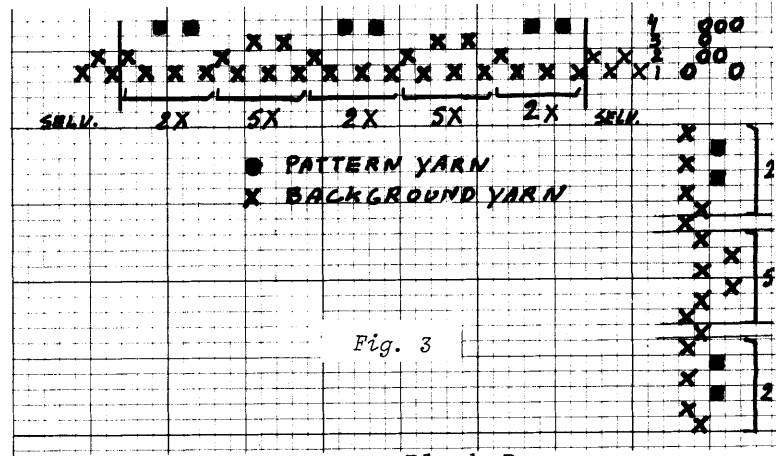


Fig. 3

Block A  
 Section I Lace with horizontal floats  
 Section II Plain weave  
 Section III Lace with horizontal floats

Block B  
 Plain weave  
 Turned lace  
 Plain weave

In order to emphasize the floats, a pattern yarn is used for the warp ends and weft picks which make the floats.

Fig. 3 gives the threading and treadling for the cloth illustrated. Selvedges are threaded on H1 and H2 as shown in Fig. 1.



Plate 1  
 Skirt woven by Willy Bottema and modeled by Cindy Bottema

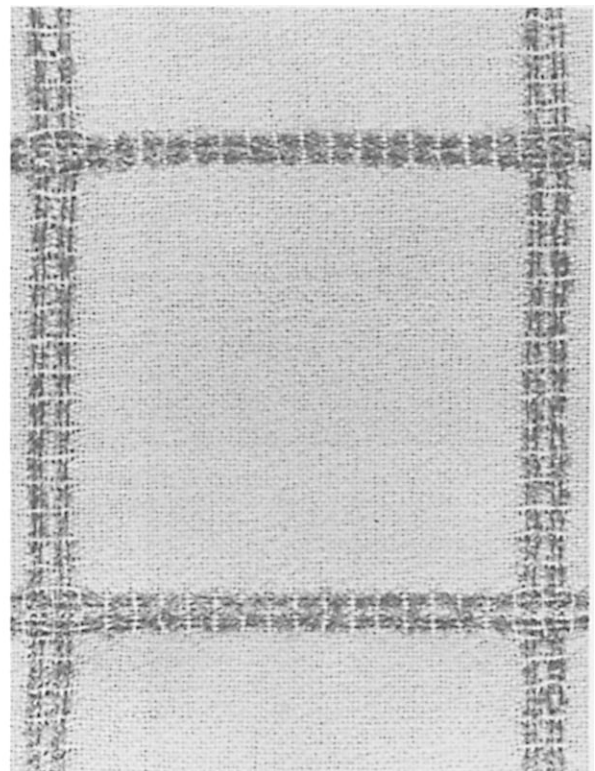


Plate 2  
 Detail of the cloth

The skirt illustrated in Plate 1 uses this technique for making large plaids. The ground warp and weft is Maypole 2 ply wool from Oregon Worsted Co. and the pattern yarn is a fine boucle from Contessa yarn. The sett is 24 e.p.i. (95/10 cm).



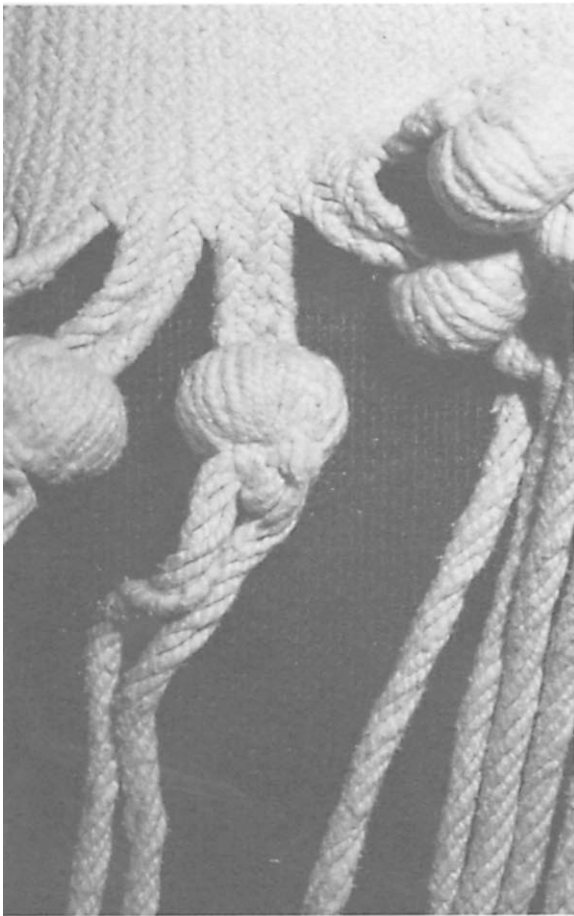


## Braiding on a Frame

(Adapted from "Braiding on a Frame" by Kate Peck Kent. Plateau Museum of Northern Arizona.)

For centuries, Hopi brides have worn the traditional wedding sash. This sash is made from two-ply white cotton, braided into a strip eight inches wide and eight feet long, including the long fringes at each end. The sash is braided for the bride by the men of the bridegroom's family in the kiva.

The Hopi Indians make their sash on a horizontal frame which consists of two smooth round poles about  $1\frac{1}{2}$  inches in diameter and 4 feet long, their ends slightly pointed. They place the end of the first pole in a hole in the wall of the kiva, about 6 inches above the floor. The pole juts out into the room at right angles to the wall and horizontal to the floor. Its other end is anchored in the hole of a loom block -- a moveable stone about a foot square, and weighing about 25 pounds. The second pole is secured in exactly the same way 5 to  $5\frac{1}{2}$  feet from the first and parallel to it (Fig. 1). The worker sits on the floor facing pole A or pole B and braids away from himself. The total length of the sash will be almost twice the distance between the poles, half of which is braided and half made into fringe.



(Handweavers: This sash can be made on a weaving frame which has a warp tensioning device. The weaving frame takes the place of the wall and loom block. Smooth dowels or closet rods are used for poles. The lower pole may be stationary, and can be inserted in holes drilled in the uprights of the frame, while two toggle bolts between the upper pole and the top of the frame enable the weaver to tighten the warp. (See Fig. 2). For the rods used in the braiding process, saw  $\frac{1}{4}$  inch dowels into 18 inch pieces. You will need about 50 rods. Other suitable tensioning devices are shown in *The Weaver's Journal*, Vol. I, No. 5, p. 11).

The worker fastens one end of the thread to pole A and wraps it continuously around the two poles without a cross. (Fig. 3). In order to have an equal number of threads on upper and lower planes of the loom, he stops wrapping at pole A, securing

*Hopi sash in the Henderson Museum collection at the University of Colorado, Boulder, Colorado*

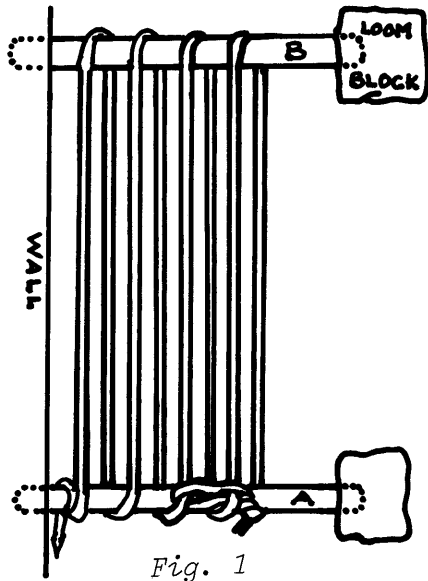


Fig. 1

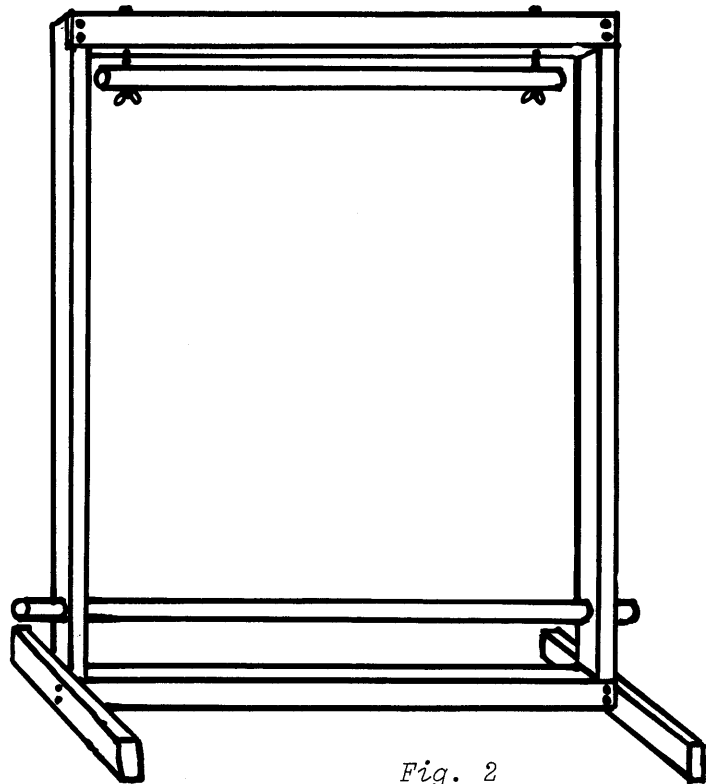


Fig. 2

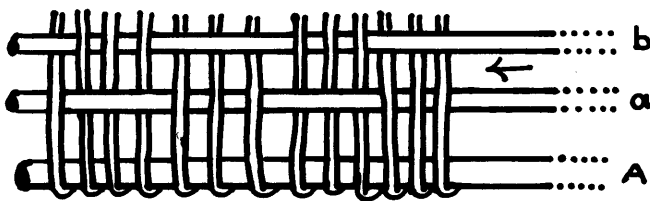


Fig. 3



Fig. 4

the end of the thread by looping it around the threads nearest to it, and tying it. (Fig. 1). The completed warp will be the width of the sash, -- about 8 inches. The warp should total 133 loops, or any number divisible by 12, plus 1.

Now the worker sits before pole A, ready to commence the braiding process. He does not interlace any weft. Instead, he interlaces warp threads with other warp threads. His tools are about 50 smooth round rods, 18 inches long and about  $\frac{1}{4}$  inch in diameter, which he keeps in an open bundle on the floor within arm's reach. These will be called "retaining rods", as they hold the warp threads in position after each braid step is done across the entire warp.

There are three stages in making the sash, -- braiding the body of the sash, making the fringe, and making the rings which are fastened to each fringe.

To braid the sash, only the threads of the upper plane are used. Braiding may be accomplished in the following manner, although the steps described are somewhat different from the procedure followed by the Hopi man:

Preliminary Step. Close to pole A, weave rod a in the warp of the upper plane by passing under 3 warp ends, over 3, under 3, over 3, etc. Weave with rod b by passing it over 3, under 3, etc. (Fig. 4). This will result in a single warp end floating under rod b on the left hand side. Insert a second rod c in the shed held by the b rod. Rod b is pulled toward the worker while rod c is

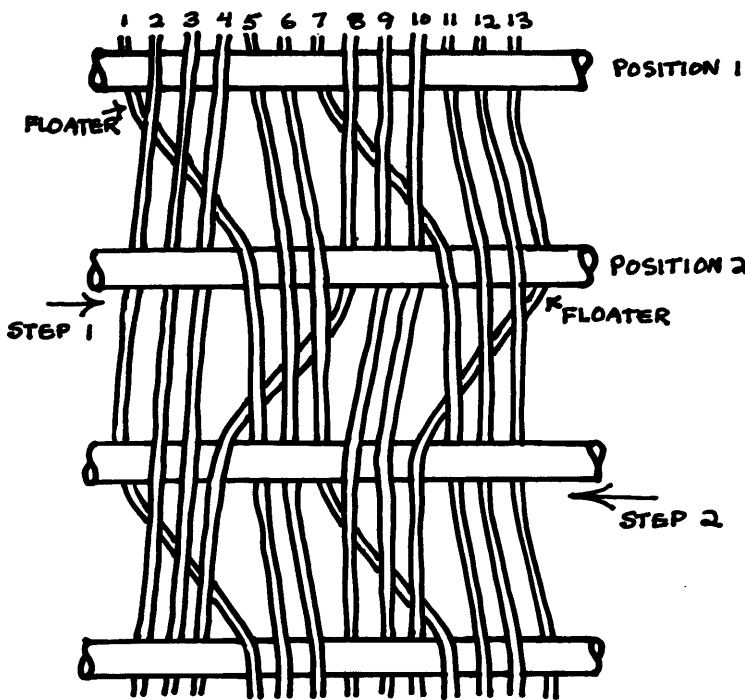


Fig. 5

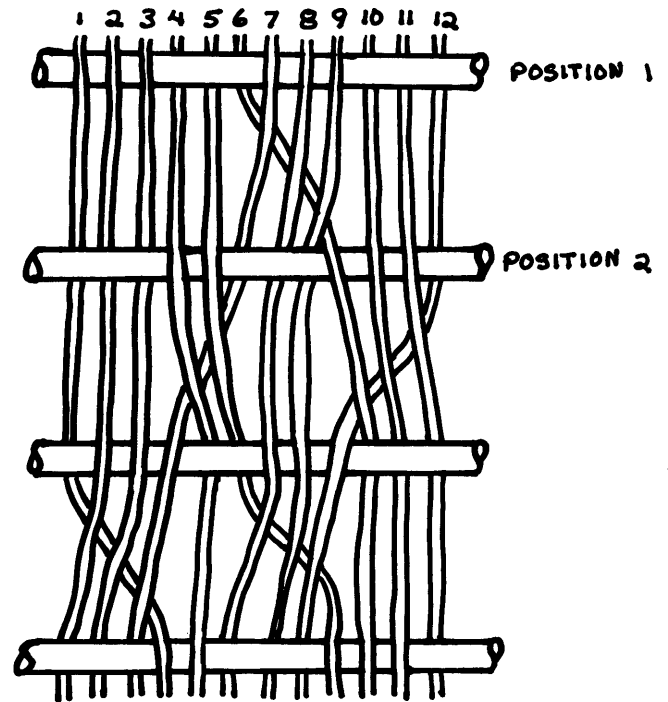


Fig. 7

moved away from the worker at arm's length into position 1. (Fig. 5).

Step 1. This step is done when the single floater is on the left hand side. The interlacement is done with the portion of the warp lying between the rods b and c. Holding a rod in your left hand, take the top 3 threads with the right hand and move them to the left. With the rod, pick up the first 3 bottom ends. Then move the next top 3 ends to the left, pick up the next 3 bottom ends, etc. When you reach the end of the warp, the floater thread will be at the right, under the rod. (Fig. 5). Slide a second rod in the same shed. Remove rod a, press rod b very lightly toward pole A. Press the first rod in the new shed toward yourself. The second rod is moved away in position 2 of Fig. 5.

Step 2. This step is done when the single floater is on the right hand side. Holding the rod in your right hand, take the top 3 threads in your left hand, move them to the right, and take the bottom ends onto a rod. Then move the 3 top ends to the right, and pick up 3 bottom ends, continuing this to the end of the warp. The floater is at the left under the rod. Slide a second rod in the same shed. Removing rod b, press one of the rods in the new shed toward yourself and push the other one in position 3 of Fig. 5. You are now ready to repeat step 1. Continue to repeat steps 1 and 2 until the body of the sash is completed. When rods fill the area in front of you (Fig. 6), slide the rods around pole B to the lower surface of the warp until they meet with the finished

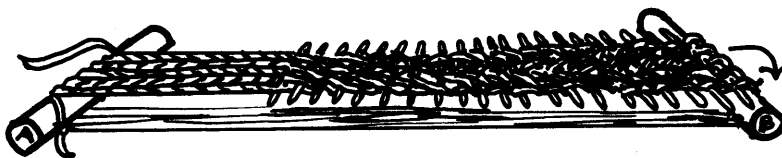


Fig. 6

portion of the braid. Then each rod in turn may be pressed hard against the woven surface and then removed.



The braid is thus started at the center of the sash and the interlacement builds up on each side. The whole warp is occasionally rotated around pole A and B for easier access to the area where the interlacement is done.

Tabs. When the body of the sash is completed, separate the threads into groups of 12 strands, with one group of 13. The braiding of a 13 strand tab is illustrated in Fig. 5, and the braiding of a 12 strand tab in Fig. 7. The tabs should be about  $1\frac{1}{2}$  inches long.

To take the sash from the loom, tie a string around the unbraided threads of each tab to keep the braid from unravelling. Slip the sash from the loom poles and fold it at the center of the braided part, so that the tabs and fringes are even, and cut the unwoven warp in half. The Hopi worker buries the fringe threads in damp sand for a time. (Handweavers can roll them in a damp towel). He next takes bundles of 6 strands (7 for a group of 13), straightens them out, and rolls them on his knee toward his body until they are well twisted. He repeats the process until he has 11 pairs of twisted bundles at each end of the sash. He ties each pair of a tab into a knot. (Fig. 8).

The decorative rings which are at the base of each tab are made of corn husk covered with two-ply white cotton thread. The worker splits a dampened corn husk into 3 strands and braids it like a pig-tail to make a strip  $\frac{1}{2}$  inch wide and  $6\frac{1}{2}$  inches long. Next he covers the braid with cotton thread. Then he forms the covered braid into a ring above the knot in the fringe thread, securing it in place.

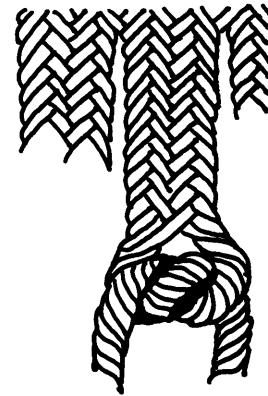


Fig. 8

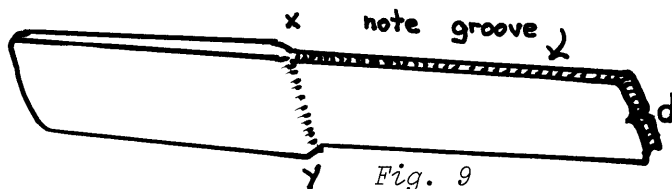


Fig. 9



Fig. 10

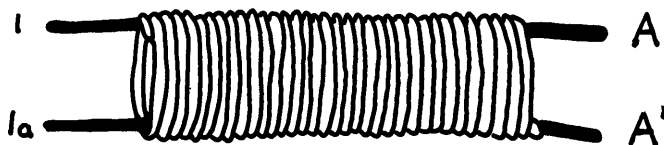


Fig. 11

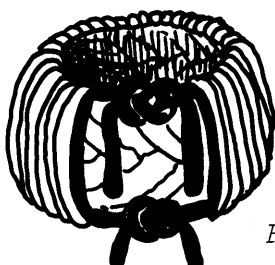


Fig. 12

Fig. 9, 10, 11 and 12 show the method of preparing the cotton thread wrapping for the ring. Fig. 9 is a diagram of the flat, 6-inch long stick the worker uses. This is highly polished wood, so the cotton threads will slip over it easily. A groove runs around the edge of the stick from x to y, with a notch d. (Fig. 9). Holding the stick in his left hand by the handle, the worker wraps one 18 inch long thread A around the stick in the groove. (Fig. 10). Holding the handle and both ends of thread A tightly, he lays one end of thread A on the face of the stick at point x and wraps it around and around the stick from left to right. He wraps it closely so the surface of the stick is completely covered. When

he reaches the right end of the stick, he cuts the thread and tucks its end (about 1 inch long) with a needle under the wrapping. Now he cuts string A at notch d. He gently pulls the ends to the right, slipping the strings along the grooves until about 1½ inches show at the ends of the wrapping. He carefully slips the wrapped section off the right end of the stick (Fig. 11), being sure A and A' stay apart, and places the strip around the corn husk ring. He ties the two ends of A in a square knot at the upper edge of the ring, and ties the two ends of A' at the lower edge similarly. (Fig. 12). He tucks all four ends under the lower knot, pulls the cotton wrapping over the knots and the white cotton ring is completed.

The sash is ready to be worn by the Hopi bride.

*All figures except Fig. 2 are redrawn from Kent.*



## *Dyeing of Wool Blends*

*by Francis Mayer*

*This is the 2nd part of an article by Francis Mayer on Wool dyeing and finishing for the handweaver. Part I was published in "The Weaver's Journal", Vol. II No. 3.*

If the wool is blended with another fiber, and both must be dyed, then the dyeing becomes more difficult and sophisticated. Wool/polyester blends require special equipment and/or special chemicals and present too many difficulties for discussion here. But blends of wool/nylon, wool/rayon or cotton, and wool/silk can be done with the same equipment as is used for wool alone. If only the wool portion of the blend has to be dyed, ignoring the other fiber present, the resulting shade will be a heather or melange. This practice is often employed in industry to make a variety of attractive products. The most difficult task is to produce a union shade; that is, dye both fibers an identical shade in the same bath. This problem of cross-dyeing is approached by even the most experienced dyers with a great deal of caution. To find the right mix of chemicals and dyes that reproduce the same shade of both fibers consistently is time consuming and often lacks a successful solution. For the benefit of those brave enough to go forth into these dangerous waters, I would like to give you a little background and make a few suggestions.

Firstly, let's look at the cross-dyeing of wool/cellulosic blends. Substrates here would include cotton, rayon, jute, or almost any fiber of vegetable origin when blended with wool. To achieve maximum fastness on cellulose, vat or cellulosic reactive dyes are normally used. However, both these dye classes require an alkaline medium for application, and the nature of wool prohibits the presence of alkali, especially at the high dyeing temperatures.

Wool is normally processed in an acid medium for it is degraded by strong alkali. There is one class of dye, the Directs, which can dye both wool and cellulose in a neutral bath, with good results. How much dye each fiber will take up will depend on the physical properties of each fiber involved, and on the nature of the particular dye involved. Their method of application is as follows:

Set the dye bath at 100°F with:

1% wetting agent (detergent)

And according to depth of shade

10-40% Glauber's Salt (Sodium Sulfate) or common salt

X% Direct dyestuff, enter the goods.

Raise the temperature slowly to 160-170°F. Sample the cotton portion.

Run ½ hour

Raise to a gentle boil; sample the wool portion.

Run 30 minutes.

Shut off heat, allow to cool back to 160°F; sample, if o.k.  
rinse and dry.

As a general rule, more salt in the dyebath causes the cellulosic fiber to dye heavier than the wool, less salt the reverse. Also, directs dye wool best at the boil, and cellulose best at 160-180°F. Using these two factors, unions can often be made by varying salt concentrations and/or dyeing times at specific temperatures. For example, if a blend when sampled has dyed the wool heavy and the cotton light, lower the temperature, add some salt and run for 20 minutes more. This will drive more dye onto the cotton and yield a better union. If the cotton is heavy, just boil for 15-20 minutes and sample again.

When the above method does not produce a union, and the wool parts have dyed somewhat lighter, a neutral dyeing acid dye can be added to the bath to fill in the wool and make it as heavy as the cellulosic fiber. Although the acid dye will preferentially dye the wool, it may stain the cellulose somewhat as well, and a slight shade change can be anticipated. Thus careful balance of both dyes must be achieved to produce a good union.

Wool/nylon union shades can be made with acid or premetallized acid dyes, for both substrates will normally have about the same dye uptake in medium depths. However, in light shades the nylon absorbs more dye, and in heavy depths the wool absorbs more dye; thus again, trial and error techniques must be employed to determine the exact formulation needed. If a heather effect is desired, add a disperse dye to the bath, for this type of dye will preferentially color the nylon.

Wool/silk blends are somewhat more difficult than other blends in that they can be dyed by wool dyes, but both fibers will not attain the same depth. Silk should be degummed before blending by boiling with 3 oz./gallon (23 g/l) of olive green soap or nonionic detergent for 30 minutes. Then it can be blended with the wool and detergent for 30 minutes. Then it can be blended with the wool and dyed in the same bath. Sulfuric acid and pre-metallized dyes will produce good color depth on the silk, but when severely boiled in the same bath the silk will be considerably lighter in shades than the wool. To obtain good solid shades when dyeing dark tones, a strong acetic acid bath is used. Start with half the amount of dyestuff just below the boil, and add the remaining dyestuff to the cooling bath.



# Summer and Winter - Part I

Summer and Winter is best known as an old Colonial weave used for coverlets. However, this weave is very interesting to the contemporary handweaver because of its many design possibilities both in form and in color and its adaptability to many types of cloth. *The Weaver's Journal*, Vol. I No. 2 (pp. 32-34) and Vol. II No. 3 (pp. 15-16) has shown the use of this weave for coat material. However, it is also ideal for household linens, upholstery fabric, pillows, wallhangings and rugs.

Summer and Winter is a block weave that can be diagrammed by a profile draft, see *The Weaver's Journal*, Vol. II No. 3. A design with two blocks requires four harnesses. Each additional harness gives the possibility of one more block. The pattern threads never float over more than 3 warp ends which produces a closely interlaced fabric with good wearing qualities.

Basic Four Harness Summer and Winter Weave. See plates 1 and 2.

WARP: 3 ply Maypole, tobacco, sett 16 e.p.i. (60/10 cm).

WEFT: ground, same as warp.  
 pattern, 7/2 Cum wool, white.

The profile draft for the sampler is given in Fig. 1.

The profile draft is obtained by scanning the cloth from right to left. Start with the wide block, called A. This block contains five identical units, of 4 warp ends each. Fill in five squares of the A row of the graph paper. Next comes a different

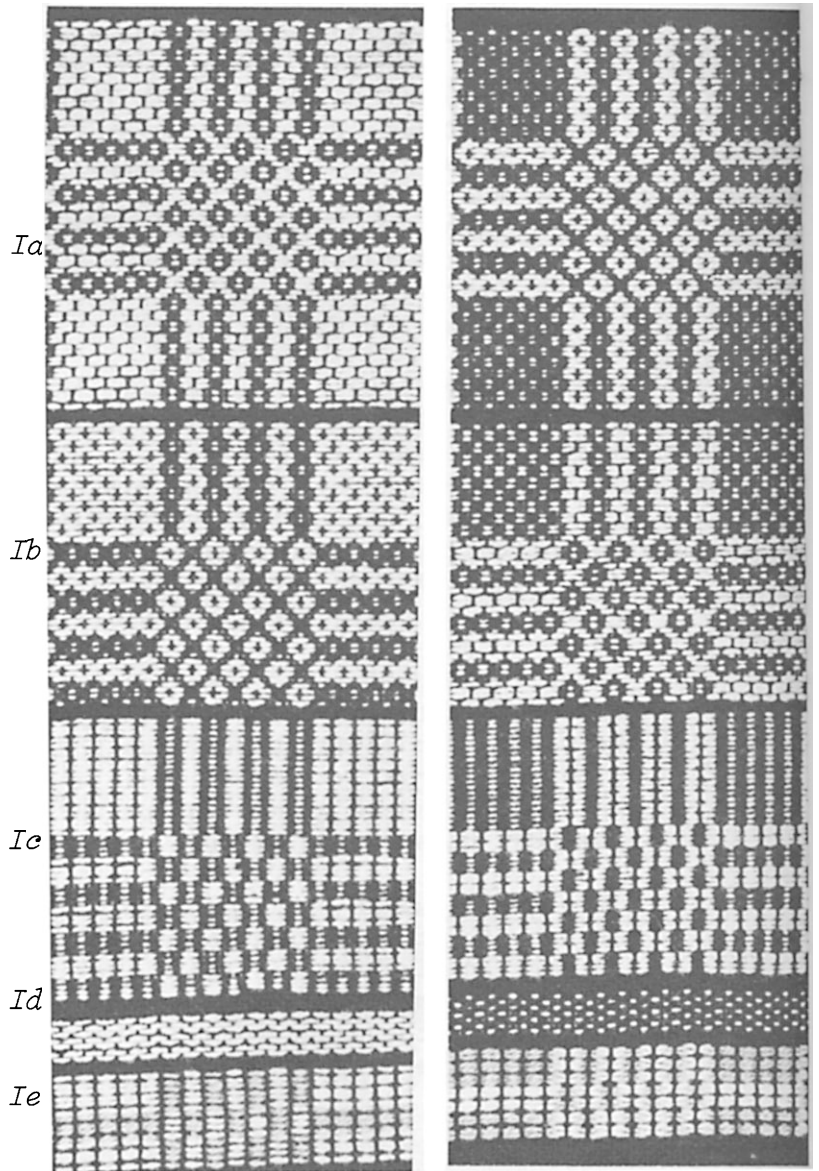


Plate 1

Plate 2  
 Reverse side of  
 Plate 1

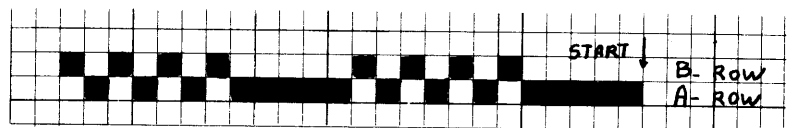
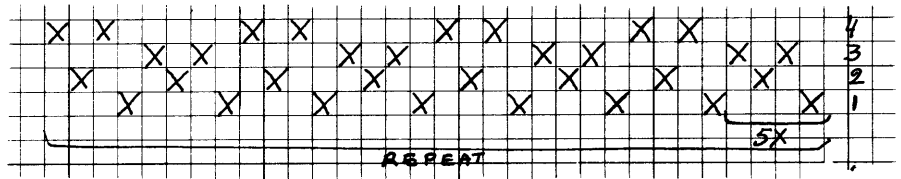


Fig. 1

block (dark), called B. This block is composed of a single unit. Fill in one square in the B row of the graph paper. Next comes a block, identical to the first one but narrower, only one unit wide. Fill one square of the A row. Go across the entire fabric and complete the profile draft.

The thread by thread draft of the sampler is given in Fig. 2.

By comparing both drafts one sees that each unit of the Summer and Winter profile draft is made up of 4 warp ends, threaded according to the block that they belong to.



	Meth. I	Meth. II	Meth. III	Meth. IV	Meth. V	Meth. VI	Special
Woven in pairs illustrated in Plate Ia	No Pattern on surface	a 8 b 7 a 7 b 7 a 8	b 8 a 7 b 7 a 8	b 7 a 8 b 8 a 7	a 7 b 8	a 7 b 7	Yellow in A & B
	Pattern in A and B	a 2 b 1 a 1 b 1 a 2	a 1 b 2 a 2 b 1	b 2 a 1 b 1 a 2	b 1 a 2 b 2 a 1	a 1 b 1 a 1	White in A & B
Woven in pairs illustrated in Plate Ib	Pattern in A	a 5 b 6 a 5 b 5	b 6 a 5 b 5 a 6	b 5 a 6 b 6 a 5	a 5 b 6	a 5 b 6	White in A Yellow in B
	Pattern in B	a 4 b 3 a 3 b 4	a 3 b 4 a 4 b 3	b 4 a 3 b 3 a 4	b 3 a 4 b 4 a 3	a 3 b 4	White in B Yellow in A
Woven in pairs illustrated in Plate Ic	No Pattern on surface	a 7 b 8 a 8 b 7	b 8 a 7 b 7 a 8	b 7 a 8 b 8 a 7	a 7 b 8	a 7 b 7	Yellow in A & B
	Pattern in A and B	a 1 b 2 a 2 b 1	a 1 b 2 a 2 b 1	b 2 a 1 b 1 a 2	b 1 a 2 b 2 a 1	a 1 b 1 a 1	White in A & B
Woven in pairs illustrated in Plate Id	No Pattern on surface	a 5 b 6 a 5 b 5	b 6 a 5 b 5 a 6	b 5 a 6 b 6 a 5	a 5 b 6	a 5 b 6	White in A Yellow in B
	Pattern in A and B	a 4 b 3 a 3 b 4	a 3 b 4 a 4 b 3	b 4 a 3 b 3 a 4	b 3 a 4 b 4 a 3	a 3 b 4	White in B Yellow in A
Woven in pairs illustrated in Plate Ie	No Pattern on surface	a 7 b 8 a 8 b 7	b 8 a 7 b 7 a 8	b 7 a 8 b 8 a 7	a 7 b 8	a 7 b 7	Yellow in A & B
	Pattern in A and B	a 1 b 2 a 2 b 1	a 1 b 2 a 2 b 1	b 2 a 1 b 1 a 2	b 1 a 2 b 2 a 1	a 1 b 1 a 1	White in A & B
Attempt at 4H Polychrome illustrated in Plate Ie		a 5 b 3 a 5 b 3	b 5 a 3 b 3 a 5	b 5 a 3 b 3 a 5	a 5 b 3	a 5 b 3	a 5 b 3 a 5 b 3

The number of repeats of the treading unit varies according to the design. In order to square out a block one should try to pack in as many repeats as there are units in the profile draft and come up with a square pattern. This may require a tabby weft that is much finer than the warp. The pattern weft may be a heavier yarn than the warp but should pack well.

Interesting color effects can be achieved by threading Summer and Winter with a colored warp as shown in Fig. 4 and by experimenting with colored tabby wefts.



Plate 3

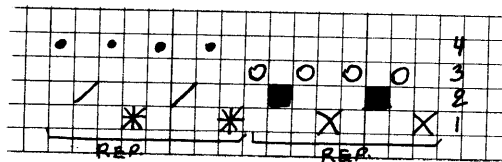


Fig. 4

Plate 3 illustrates a pillow in 4-harness Summer and Winter, done on the same warp as the sampler but mixing the various methods of treading and using 3 different colors for the pattern weft.

Multiple Harness and Polychrome Summer and Winter

In order to design for Summer and Winter one has to use graph paper and fill out entire squares with color, starting with 2 colors. For instance, draft a black design on white paper.

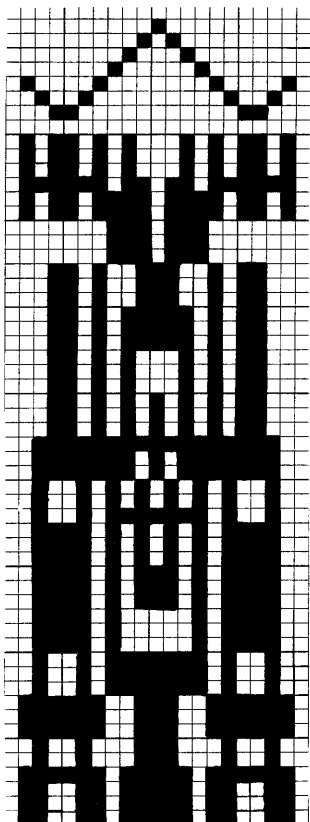


Fig. 5

See Fig. 5. Above the design, graph the profile draft.

Above each vertical column of the design, fill a square in the appropriate block row remembering that each column is drafted on a different row unless the entire strip is identical to one which is already drafted.

Treading method I through VI may be used. Let's consider method I for example:

Tr. a is tied to H1 plus H2.

Tr. b is tied to all the pattern harnesses.

The treading sequence will be:

a - white ground weft.

H2 plus all the pattern harnesses of the blocks that are white on the paper - black pattern weft.

b - white ground weft.

H1 plus all the pattern harnesses of the blocks that are white on the paper - black pattern weft.

a - white ground weft.

H1 plus all the pattern harnesses of the blocks that are white on the paper - black pattern weft.

b - white ground weft.

H2 plus all the pattern harnesses of the blocks that are white on the paper - black pattern weft.



Plate 4  
Opera bag woven by Iris Richards

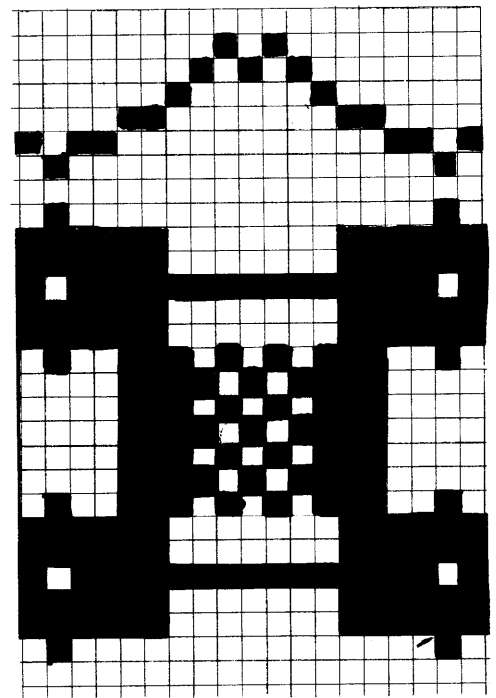


Fig. 6

The bag illustrated in Plate 4 was woven on 8 harnesses, using the design illustrated in Fig. 6.

WARP: 2 ply Maypole, black, sett at 24 e.p.i. (100/10 cm).  
WEFT: tabby, same as warp.  
pattern, Molino floss, silver.

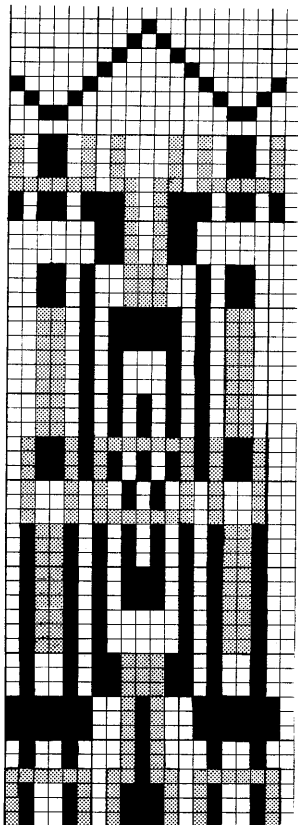


Fig. 7

There are two approaches to polychrome Summer and Winter. One uses two colored pattern wefts and a tabby weft, the other uses 3 colored pattern wefts and no tabby. In theory, the number of colored pattern wefts may be larger but the weaving is not practical.

#### Polychrome Weave I

Modify your design, using colored pencils. Each horizontal row of the design can have the background color and one or two pattern colors. The colors may vary from one horizontal area of the design to another. See Fig. 7. Check the profile draft and make sure that it has not changed. The basic tie-up is given in



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Only six treadles are used but treadles 5 and 6 are retied whenever the pattern changes.

Using method I for the treadling, the sequence for polychrome Summer and Winter will be:

a - white ground.

H2 plus all the pattern harnesses of the block colored white and red (selected pattern harnesses #1 or treadle 5) - black pattern weft.

H2 plus all the pattern harnesses of the block colored white or black (selected pattern harnesses #2 or treadle 6) - red pattern weft.

b - white ground.

H1 plus selected pattern harnesses #1 - black pattern weft.

H1 plus selected pattern harnesses #2 - red pattern weft.

a - white ground.

H1 plus selected pattern harnesses #1 - black pattern weft.

H1 plus selected pattern harnesses #2 - red pattern weft.

b - white ground.

H2 plus selected pattern harnesses #1 - black pattern weft.

H2 plus selected pattern harnesses #2 - red pattern weft.

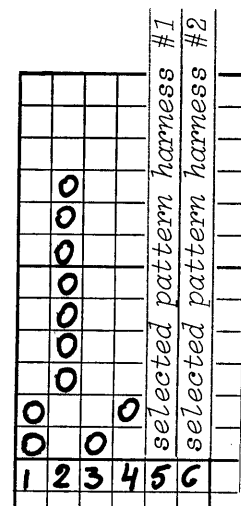


Fig. 8

Note: Even if black does not show in part of the design, the black pattern weft has to be thrown. For these shots use treadle 3 plus treadle 2 together or treadle 4 plus treadle 2.

Plate 5 shows the design of Fig. 6 woven on a blue ground.

WARP: 3 ply Maypole, 15 e.p.i. (60/10 cm).

WEFT: tabby, same as warp.  
pattern, 7/2 Cum wool.

### Polychrome Weave II

The same modified design of Fig. 7 may be used. However, with this technique, the ground is replaced by a third pattern weft color. No ground weft is used and of the warp only the ties show on the surface. These ties should show as little as possible and therefore should be a fine, neutral colored warp thread. The weave should be as weft face as possible, thus the warp should be very smooth and the pattern wefts should pack well.

The tie-up is given in Fig. 9. Treadles 3, 4, 5 are retied after each change in the design.

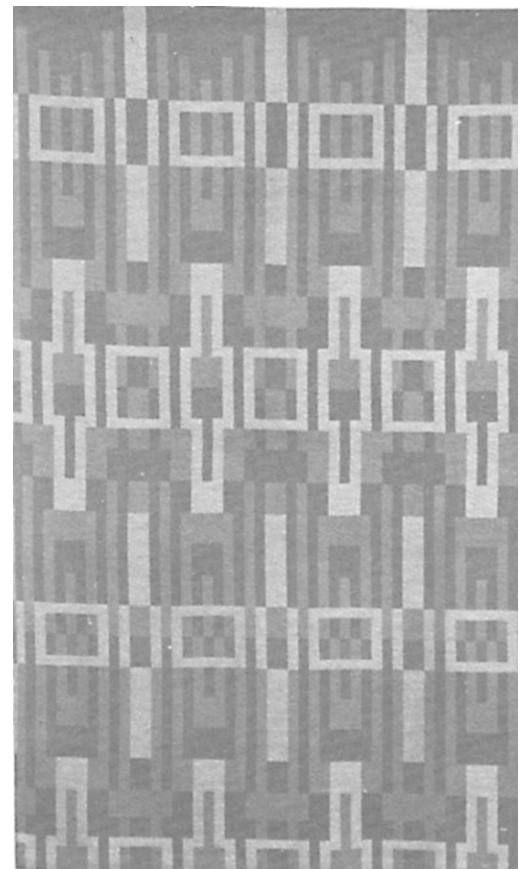


Plate 5  
Wall Panel woven by Clotilde Barrett

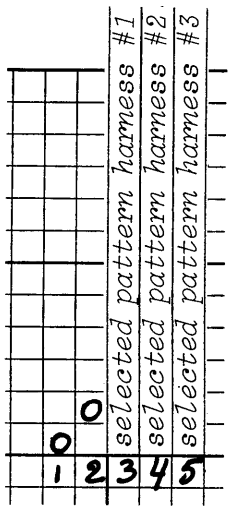


Fig. 9

If the pattern is woven in white, black and red, then selected pattern harnesses #1 are the pattern harnesses of the blocks that are colored red and black, selected pattern harnesses #2 are the pattern harnesses of the blocks that are colored red and white, selected pattern harnesses #3 or the pattern harnesses of the blocks that are colored white and black.

The treadling sequence will be:

- treadle 1 plus treadle 3 - white
- treadle 1 plus treadle 4 - black
- treadle 1 plus treadle 5 - red
- treadle 2 plus treadle 3 - white
- treadle 2 plus treadle 4 - black
- treadle 2 plus treadle 5 - red

An effect of color shading may be obtained by letting two different colored pattern wefts float on the surface in the same block. The selected pattern harnesses will always be the ones of the blocks where the colored weft does not appear on the surface.

If three colors are used at any time, one should weave with those three colors even in areas where only two colors appear on the surface otherwise the character of the cloth will be inconsistent. For those picks, lift all pattern harnesses and one tie-down harness.

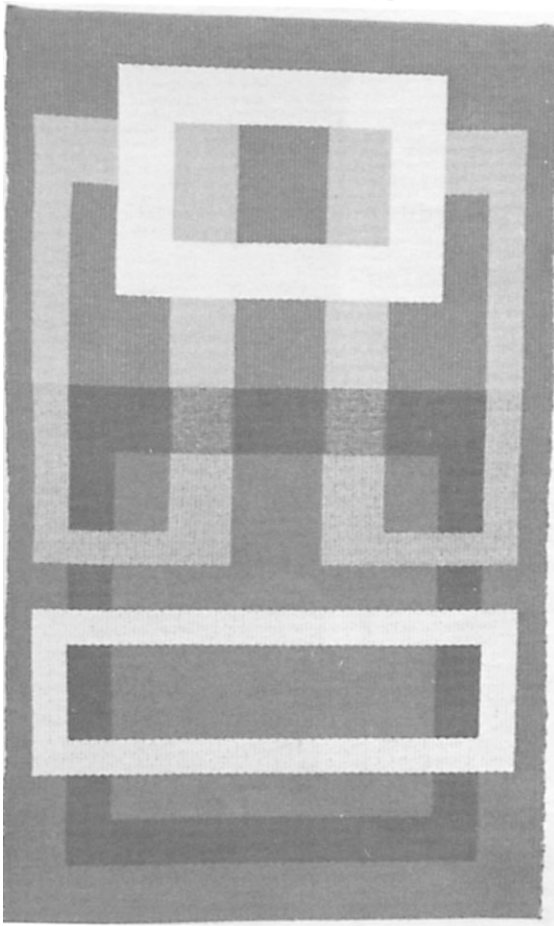


Plate 6  
3 color Polychrome Hanging  
woven by Ellen Champion

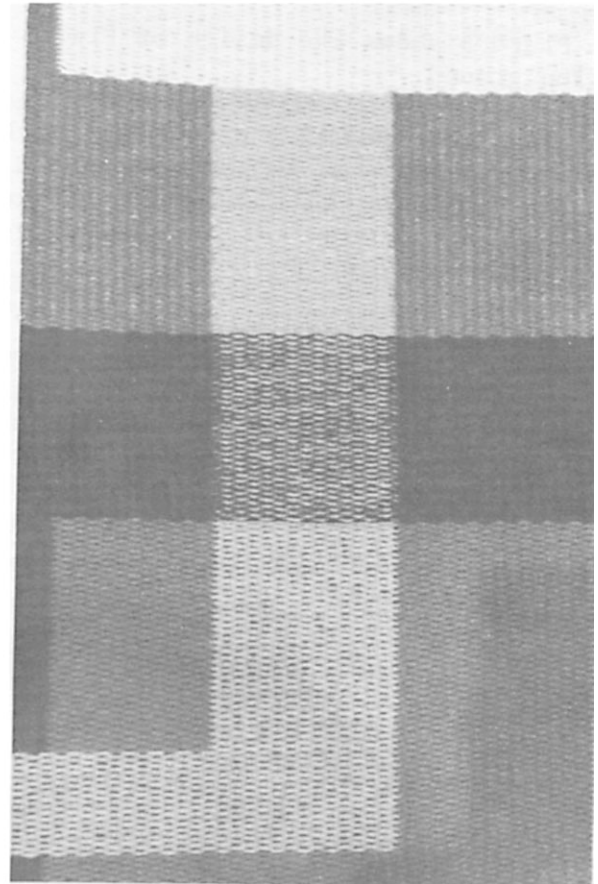


Plate 7  
Close up of Plate 6 showing an area  
where 2 colors appear in the same block

Plate 6 illustrates this method of polychrome Summer and Winter.  
 WARP: on pattern harnesses, Lily Frost Tone.  
       on tie-down harnesses, fine cotton from H. Bathgate, Galashiels.  
 WEFT: 2 ply wool, about 6/2, softly spun.  
 SETT: 10 e.p.i. (40/10 cm).

Summer and Winter rugs will be discussed in Part II of this article.



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results in a row coded thus:

wbrypggyrbwbrypggyrbw	- weft colors as they appear in woven cloth
123456543212345654321	- treadles or shafts carrying the warp which is covered

Color-coded rows can be stacked vertically to build patterns such as people, geometric designs, etc. See Fig. 2.

With today's modern fine-point color-edmarkers so available, it is preferable to use them to indicate color in a draw-down instead of using symbols or codes as above. Using the markers has the additional advantage of enabling the drawdown to indicate the slight weft slants which are dependent on the order in which the wefts are packed down. To illustrate:

If the treadling sequence is 1, 2, 3, 4, 5, 6, the row of wefts will look like this:

-	\	\	\	\	-	/	/	/	/	-	\	\	\	\	-	/	/	/	/	-	\	\	\	\						
1	2	3	4	5	6	5	4	3	2	1	2	3	4	5	6	5	4	3	2	1	2	3	4	5	6	5	4	3	2	1

If the treadling sequence is 6, 5, 4, 3, 2, 1, the row of wefts will look like this:

-	/	/	/	/	-	\	\	\	\	-	/	/	/	/	-	\	\	\	\	-	/	/	/	/						
1	2	3	4	5	6	5	4	3	2	1	2	3	4	5	6	5	4	3	2	1	2	3	4	5	6	5	4	3	2	1

The difference between the two is slight, but the order used does make a noticeable difference between a smooth or a ragged edge on a diagonal line (such as a person's shoulder, a diamond, etc.). See Fig. 3.

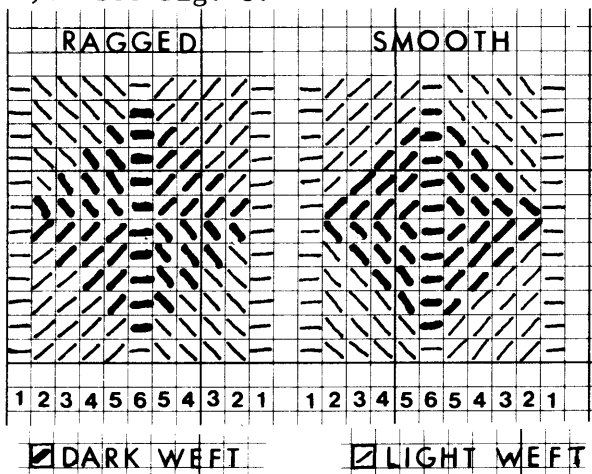


Fig. 3

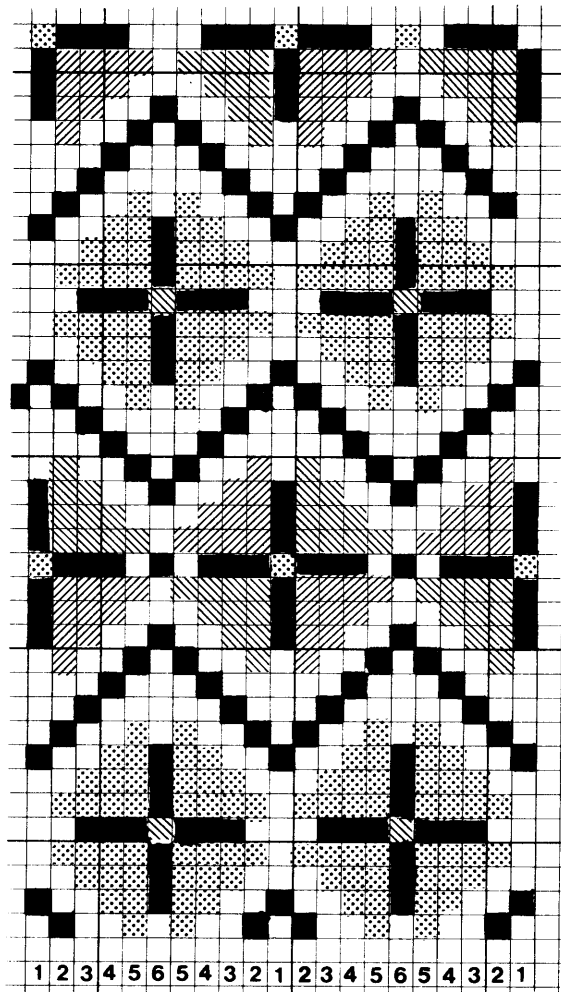


Fig. 2

There are advantages and drawbacks to this boundweave technique, using each shaft for one block of pattern on the face of the fabric. One advantage is that each block is completely independent of the others, not overlapping or sharing any warps. In addition, no part of a block is covered by a later shot in the sequence; there are no longer skips to cover the short ones. Since each weft shot can be any color, this boundweave allows very crisp and finely-detailed pattern.

The main disadvantage of the weave is that it is one-sided; the reverse of the fabric is heavily padded by the undershots. This dominance of one surface does tend to make the fabric curl towards its back at the edges. Good selvages are also difficult, and the edge motifs are distorted. Recognizing these diffi-

culties, I used a floating selvedge thread on each side of the warp to keep most of the wefts extending to the edges, and I planned to mat or frame the fabric so that the motifs nearest the edges would be covered. The fabric could also be used to cover a pillow, with the reverse of the fabric hidden, and the edge motifs used as seam allowances.

Another drawback to the weave is that it requires a large amount of weft yarn, since it takes a whole pick of weft just to make one spot (such as a mouth of a figure), and six picks of weft just to make a single horizontal line.

The following drawdowns illustrate a few motifs on the six-shaft draft, including one of the professors from "Academic Procession". Most of these figures use shafts 2-6 to form a 5-block pattern, always weaving shaft 1 in the background color to form a vertical division between the figures. Please note that all squares of the drawdown do weave; the blank squares indicate shots of background color. See Fig. 4.

Some of the figures shown are adaptations of 4-shaft boundweave people by Jane Evans, Iris Richards, Joyce Chown, Harriet Tidball, and Alan Mackenzie. The rest are my inventions, stylized from "National Geographic Magazine" photos. The warp used in "Academic Procession" (Plate 1) is a white 12/2 rayon (or mercerized cotton?) sett at 12 e.p.i. (50/10cm). Wefts are an assortment of fine 2- and 3-ply wools and orlons.

In addition to a seemingly infinite variety of geometric designs and representative figures which can be woven using this boundweave on a six-shaft point twill threading, selected (symmetrical) letters of the alphabet can be woven. Capital letters with a vertical plane of symmetry (A, H, I, M, O, T, U, V, W, S, and Y) can be woven upright. Letters with a horizontal plane of symmetry (B, C, D, E, H, I, K, O, and X) can be woven sideways. So if your "professor" teaches at Minnesota University, you can even weave his institutions initials above his portrait!

I'm weaving-bound; how about you?

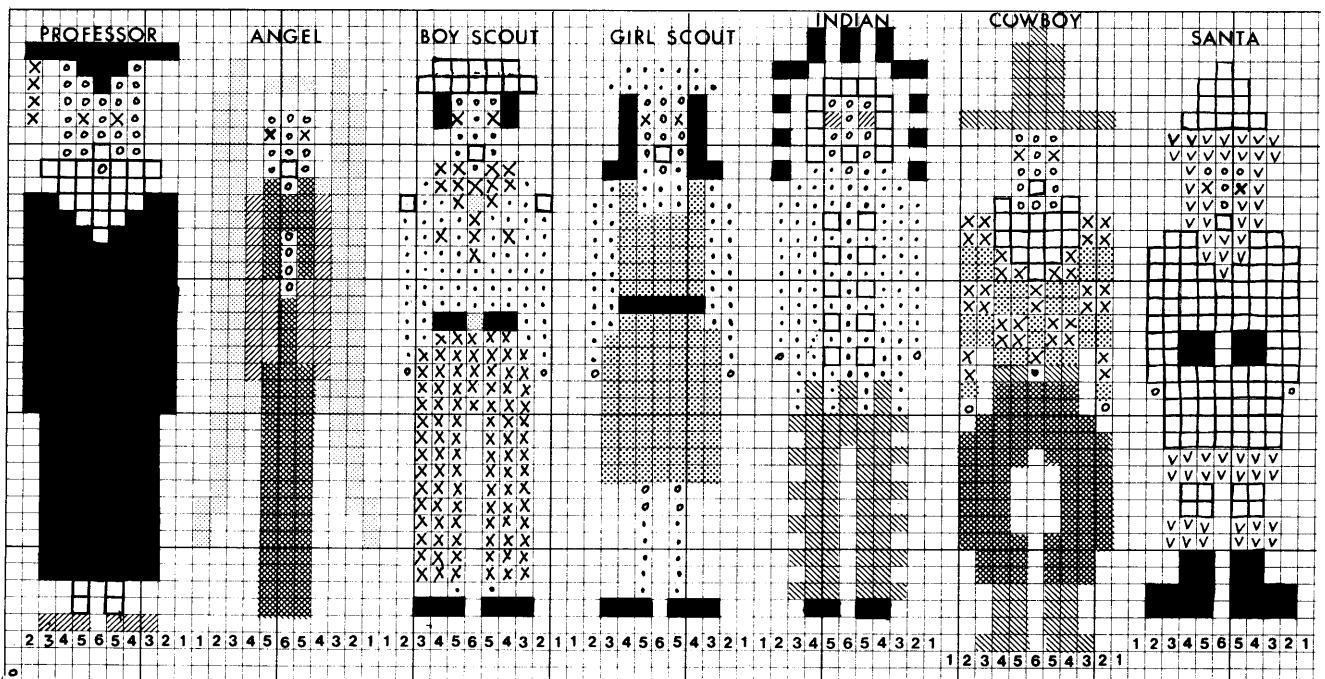


Fig. 4

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## *Book Reviews*

### *by Clotilde Barrett*

HANDSPINNING COTTON by Olive and Harry Linder. Cotton Squares, Phoenix, AZ, 1977, 50 pp.

In this small paperback book, the authors share, with generosity, their experiences of spinning cotton and using it in fiber art. Their style of writing is informal and easy to read. The authors emphasize the enjoyment of spinning and weaving cotton.

The process of cotton spinning is discussed for a wide variety of handspindles and wheels. The text deals with the properties, the scouring and carding of cotton fiber and also the setting and dyeing of the yarns. There are also suggestions for projects to be woven with handspun cotton.

The illustrations are informative and clear. Unfortunately they do not follow the sequence of the text and there is no reference to them anywhere. The Pakistani wheel described in the first half of the book is unexpectedly illustrated at the very end.

MANUAL OF SWEDISH HANDWEAVING by Ulla Cyrus-Zetterstrom. Charles T. Branford Co. Mass. 2nd U.S. edition, 1977, 186 pp. \$12.95.

Books for the more advanced weaver are not plentiful. This book falls into that category. It was first published in the U.S. in 1956 but had been out of print for years and was sorely missed.

To a great extent this book deals with fabric structure. The drafting system is explained at the very beginning while the analysis of fabric structure is taught later on. The author starts with the main classes of weaves: plain weave, twill and satin. Even in these first chapters she uses the terminology and weave structures more commonly found in industrial textbooks than in handweaving books. This is why the beginning weaver might be disoriented and overwhelmed with the deluge of patterns that can be derived from some basic ones. The advanced weaver, however, will be stimulated by the broad range of fabric structures and will want to design his own variations of known patterns. But even the expert might be confused by the chapter, "Varied Rep Structures", when he realizes that it deals mainly with boundweave woven on rosepath threading. Lacey weaves, and weaves with surface interest, are combined in one chapter

which includes some interesting Swedish weaves and some beautiful multiple harness interpretations of well known structures.

The study of "Combined Structures" quickly leads to damask and related fabrics. The author explains the use of long-eyed heddles, draw looms and jacquard looms.

The overshot technique, handled from the point of view of a Swedish weaver contains interesting variations of this all-time American favorite. It encompasses overshot, opposite overshot (monk's belt), crackle, Summer and Winter and some pick-up methods using long-eyed heddles and two sets of harnesses. The theory of backed fabrics leads to the discussion of double weave. Justifiably "The Manual of Swedish Handweaving" has been considered one of the best texts on this subject.

The author teaches how to derive additional patterns from existing structures and how to draft color effects in woven fabric. The book also contains tapestry techniques, finger-manipulated loom laces, inlay and pile and loop techniques.

The latter part of the book consists of a series of chapters, complete in themselves, with technical information on sett, yarn counts, calculation of take-up, shrinkage and yarn, on weaving and weaving equipment. The information on countermarch looms will be invaluable to the fast-growing number of weavers who favor such a loom.

This book contains such a wealth of information plus diagrams, photos and colored plates, that, at times, the handweaver may be overwhelmed. Yet his efforts to study all this will be amply rewarded by an ability to design exciting fabrics.

TECHNIQUES OF GUATEMALAN WEAVING by Lena Bjerregaard, Van Nostrand Reinhold, N.Y., 1977, 96 pp. \$12.95.

Weavers interested in backstrap looms, those interested in ethnic weaving and those interested in weft inlay and brocading techniques will find in this book a great deal of technical information and inspiration for designs. Also, collectors of textiles and those interested in South American lore will find this text informative and may even end up becoming weavers too.

After a brief introduction to the weaving tradition in Guatemala the author gives detailed instruction on how to build and set up a backstrap loom. The technique is well taught. With the aid of diagrams and photos, the student is carefully helped through each one of the steps. All the cloth described is predominantly warp-face fabric woven with a ground weft and a pattern weft. The different brocading techniques used by the Guatemalan weavers are difficult to describe but by means of drawings and photos the author covers every step. The technical chapters are interspersed with anecdotes and photos about the life of the villages which the author visited. Local patterns and some of their symbolic meanings enliven the book.

As with many translated books the technical instructions are at times awkward. However the information is repeated step by step as captions under very clear drawings.

It is a good book and certainly helps fill a void of books published on native American weaving.





# First Prize for the Holders of Hot Pots Show

by Ellen Champion

The first prize for the HOLDERS OF HOT POTS contest, sponsored by The Weaver's Journal, during Convergence '78, was woven in 4 harness double weave pick-up techniques, a combination of the Mexican and the Finnweave methods. The combination was used because the Finnweave gives a better shed when a large amount of warp ends are picked up for either pattern or background. The Mexican method does not allow the use of the beater after each pick but is somewhat faster. This method works best when a small percentage of the warp has to be picked up for the design. The design was drawn on 20 x 20 to the inch graph paper, each square representing one warp and one weft thread of each layer of cloth. The lines drawn on the graph paper were then used to determine the number of threads of the design to be picked up for each pair of wefts thrown. See Fig. 1.

The area to be woven was 25" x 25" (64 x 64 cm), with a border of 2" (5 cm) all around for wrapping behind a 25" (64 cm) circle of plywood. Allowing for take-up, 30" (76 cm) was sleyed in the reed, 30 e.p.i. (120/10 cm), two threads per dent in a 15 dent (60/10 cm) reed. Maypole "Nehalem" 3-ply wool was used. The sky (lt) in both warp and weft is #1807 dove grey. The earth tones (dk) in the warp are ombre effects with #1625 charcoal, #341 tobacco, #547 olive, and #36 tobac tan, #44 camel and #283 mustard. The earth tone weft is #36 tobac tan, about the middle of the earth tone range. The warp threading draft and tie-up are shown. (Fig. 2).

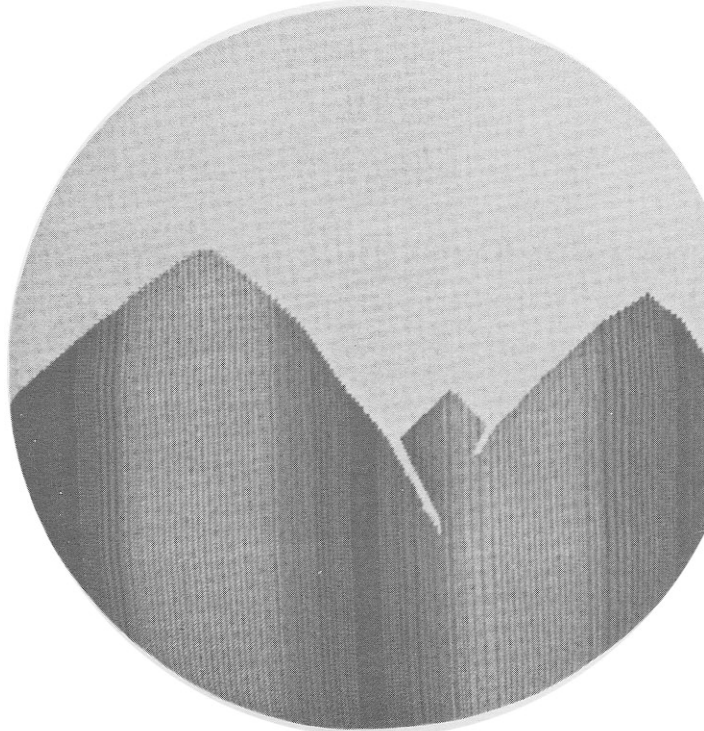
For section I, Fig. 3:

Weave double cloth showing dark on the top layer and light on the lower layer of cloth. Use two shuttles, one dark and one light. Raise harness 4, weave dk, H3, weave dk, H2, 3, 4, weave lt, H1, 3, 4, weave lt.

For section IV, Fig. 3:

Weave the light cloth on top and dark underneath. Raise H1, 2, 4, weave dk, H1, 2, 3, weave dk, H2, weave lt, H1, weave lt.

For the Mexican method of pick-up, the following 4-pick sequence is used:



*The Rocky Mountains  
The Weaver's Journal design woven by  
Ellen Champion*

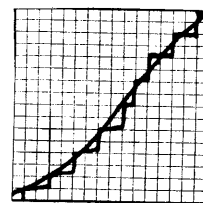


Fig. 1

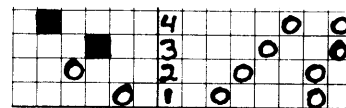


Fig. 2

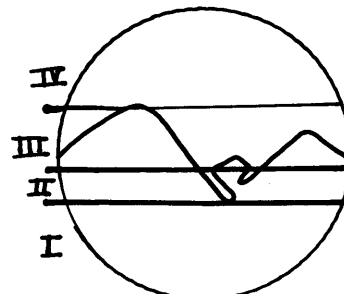


Fig. 3

- A. 1- raise H1, 2, (lt) pick up lt design threads, leave pick-up stick in the shed, close to the reed.  
 2- raise H4, push pick-up stick back to reed, weave dk.  
 3- raise H3, weave dk, remove pick-up stick, beat.
- B. 1- raise H3, 4, pick up dk background threads, leave pick-up stick in shed.  
 2- raise H2, weave lt.  
 3- raise H1, weave lt, remove stick, beat.

For the Finnweave method of pick-up, the following 4-pick sequence is used:

- A. 1- raise H1, 2, (lt) pick up lt design push stick to reed, stand on edge.  
 2- raise H3, 4, (dk) place round stick under the cross formed behind the reed, see Fig. 4. Remove pick-up stick in front of reed.  
 3- raise H1, 2, 4, weave dk, beat.  
 4- raise H1, 2, 3, weave dk, beat, remove back stick.

- B. 1- raise H3, 4, (dk) pick up dark background, push stick to reed, stand on edge.  
 2- raise H1, 2, (lt) place round stick under the back cross behind the reed, remove front pick-up stick.  
 3- raise H2, 3, 4, weave lt, beat.  
 4- raise H1, 3, 4, weave lt, beat, remove back stick.

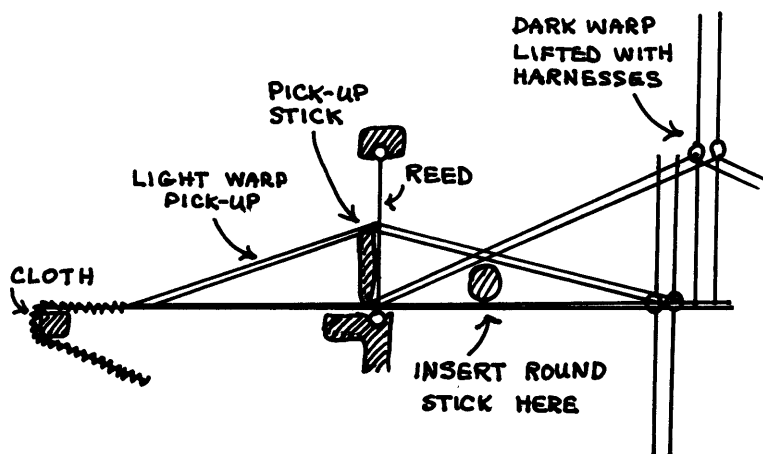


Fig. 4

The Mexican method is one step shorter for each pair of weft shots, three instead of four, but has the disadvantage of beating two weft shots into place at one time. A beater-sword can be used after the shed has been changed, and before the second weft has been thrown, to beat the first weft into place.

The Finnweave method has four steps per pair of weft shots, but has the advantage of being able to beat each weft as it is thrown. The weaving shed for either method is small. A shed stick is helpful to widen the shed.

. It is possible to combine the methods. For instance step A of the Mexican method was used in combination with step B of the Finnweave method to weave the area II, Fig. 3, of our design, because of the large amount of dark ends to be picked up when weaving the light picks.



Visit the Pot Holder Show at *The Weaver's Journal* studios during Convergence, '78. For details, see back cover of this issue.

# Home Built Box Spinner

by Cynthia Barrow

With an apple crate, a motor and accelerator from a sewing machine or from a discarded machine, twine, wire, a few screws and a bit of simple carpentry, you can build a box spinner.

Beginners can learn how to spin on this inexpensive, simple spinning device. But if you are an experienced spinner it could prove useful as an additional piece of equipment because you can spin jumbo yarns on it as there is no size limitation by an orifice.

Citing John Horner's, "The Linen Trade in Europe During the Spinning Wheel Period" as his source, Allen Fannin, in "Handspinning - Art and Technique",<sup>1</sup> writes about the origin of the spinning wheel in India. He writes: "This took place several hundred years at least before the traditional spinning wheel as we know it was conceived. The Indian wheel, as pictured in Horner's book, is very close to the handspindle. As originally made and as still found in parts of India today, this wheel is simply a drive wheel and a horizontally placed spindle. The spindle is mounted between bearings and operated by a band passing around it and the drive wheel. It is based on the principle of using one rotary motion (the drive wheel) to produce another rotary motion (the spindle) with a multiplication of speed." It is interesting to note that this box spinner uses a high speed electric motor in place of the drive wheel found on the Indian spinner. In contrast to the Indian wheel, the box spinner reduces the speed of an electric motor to drive the spindle at a proper speed.

The method of spinning on the box spinner is much the same as that used when spinning on the high wheel. The twisting of the fiber, the drawing out, and the winding of the spun portion of yarn onto the base of the shaft are the same. For those who are unfamiliar with this technique, it may be helpful to read about it in Fannin's "Handspinning" or in Simmons "Spinning and Weaving With Wool".<sup>2</sup> The high wheel has the disadvantage of leaving only one hand free for the draft because the other is needed to turn the wheel. The box spinner, having no fly-wheel, leaves both hands free to control the draft.

The high wheel and this box spinner share the disadvantage of a two-step process of spinning and winding on and are therefore slower than the traditional spinning wheel. I find the sound of the electric motor unpleasant and, of course, it has the disadvantage of using electric energy.

However, it has its advantages. It is inexpensive and can easily be built at home. The inexperienced spinner will find it easier to learn to spin on as it requires less co-ordination. The spinner can stop the twisting abruptly (no fly-wheel) and the wheel does not pull in the yarn and "gobble it up" before it is spun. One needn't burst into tears, as I did when learning to use my flyer wheel, upon seeing the whole unspun rolag disappear into the orifice for the twentieth time! Also, there is no wheel to reverse in direction, another frustration often encountered by beginners using the flyer wheel.

I think the experienced spinner will find that the greatest advantage is the lack of an orifice. The orifice limits the diameter of the yarn spun. On the

box spinner jumbo yarns can be spun. This spinner is easy to use for creating decorative yarns by the addition of nubs or slubs, for controlled over-spinning and under-spinning with a delicate wind-on. Plying can be done by reversing the spindle's direction. This can be done by removing the rubber band at the motor, putting a half-twist in it, and replacing.

Others will, no doubt, find new applications for these spinners. I recently realized its usefulness in under-spinning extra thick roving for coiled basket weft material. If only for its simplicity, I think the box spinner deserves to be better known.

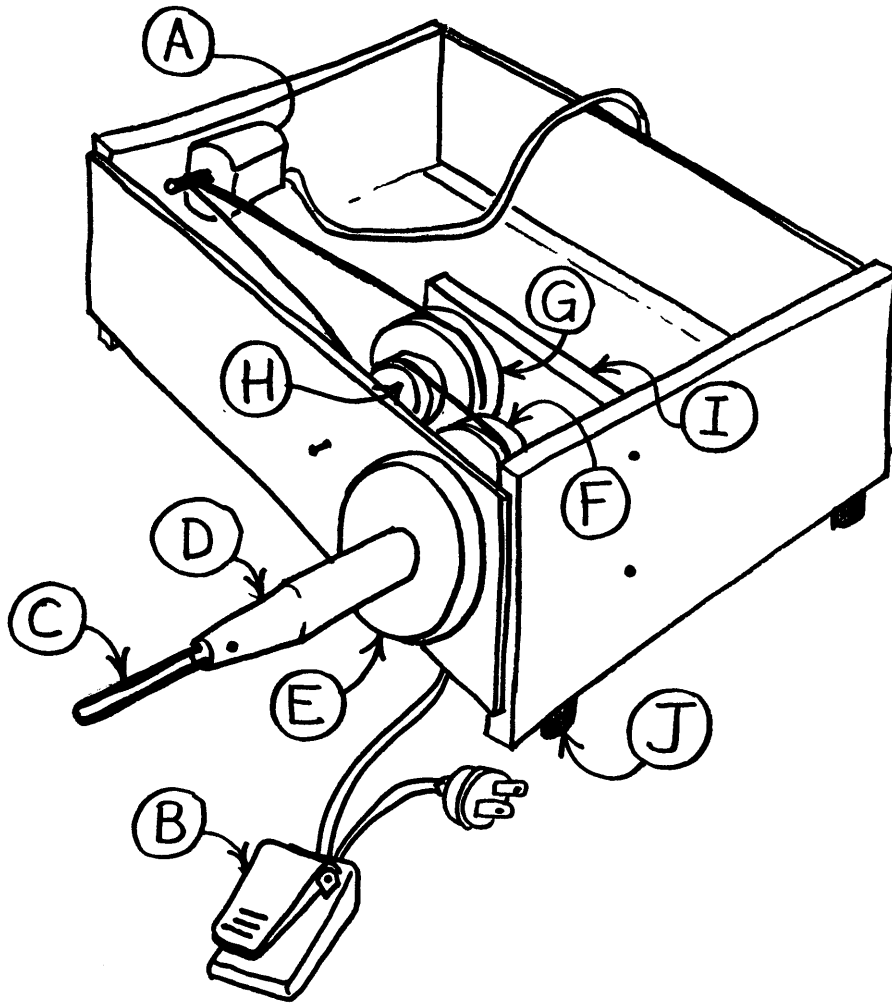


Fig. 1

MATERIALS NEEDED: For the construction of the box spinner. See Fig. 1.

Two apple crates (one in good condition).

A and B. Motor and foot control and cord. Montgomery Ward catalog-Fall and Winter, 1977, p. 1041, \$23.94.

C. 9" coat hanger wire.

D. 1½" dowel 6" long (large tool handle).

E, F, G. 4" diameter x ¾" thick.

H. 2" diameter x ¾" thick.

I. 4 ¾" x 10½" x ¾" thick; (ends of the spare crate) 6" of 3/8" dowel; 7 finishing nails 1½" long; Elmer's glue, machine screws to fit electric motor base (usually #10-32 x 1"

long); rubber bands or string (see assembly).

J. 4 rubber feet (optional).

#### ASSEMBLY SUGGESTIONS:

1. Taper D for 3" down to ¾" diameter. Drill a 3/8" hole through 1" from small end. Drill 2 holes to fit C in small end 3/8" apart through to cross-drilled hole. Drill 3/8" hole 1½" deep in large end (do this carefully).

2. Bend C in half so that legs are 3/8" apart.
3. Push C ends into holes in small end of D until they are visible in cross drilled hole. Bend these ends with a punch to secure the wire loop C.
4. Cut E, F, G and H into discs and drill a 3/8" hole in centers to give a snug fit on the 3/8" dowel. Cut a "V" groove 1/16" deep on the outside middles of F, G and H. (This can be done by holding a short piece of 3/8" dowel in an electric hand drill and pressing the discs on the dowel. With the drill running, press the edge of a file on the wood and cut the groove.)
5. Drill 2 holes in I on a center line running lengthwise 3" and 7½" from one end. These holes are a loose fit for the nails. Put I on the inside of crate and transfer the hole positions to the outer board. Drill a 3/8" clearance hole through outside board nearest to the corner and a nail clearance hole through the other.
6. Position I 1 3/4" away from side and secure with glue and 4 nails.
7. Cut 2 pieces of 3/8" dowel 1 5/8" long and 4 1/8" long. Drill holes in ends 1" deep for a push fit of nails without splitting dowels. Push the long dowel through E into D leaving 2 1/8" protruding. Push the short dowel through G and H leaving 1/16" protruding on both sides.
8. Mount A so that its pulley is in line with G.
9. If using heavy rubber bands for belts, place in position before assembling pulleys. If string is used for belts, it should be installed after pulleys are in place. Put the spindle dowel through box side and F. Then put a nail through I into end of spindle dowel. Install G and H by pushing nails through box and I into the dowel.

Note: The pulley system is used to reduce the speed of the spindle to about 1/20th of the motor speed. The nails turning in the boards serve as bearings. The pulleys and spindle are tight enough on the dowels to prevent slipping. Use olive oil on wood squeaks.

#### TO SPIN ON THE BOX SPINNER:

Tie one end of a 12" piece of yarn securely to the shaft base. This will serve as a leader or "tie-in" thread.

With your fingers, tease open the twist in the end of this yarn.

Seat yourself comfortably behind and parallel to the spinner, the shaft immediately before you. Have within arm's reach a supply of prepared wool in the form of carded rolags or commercially prepared wool. You are now ready to spin.

Draw out the fibers on one end of a rolag and using both hands, overlap the teased end of leader with the drawn fibers of the rolag. Hold the two overlapped ends together with the thumb and forefinger of your left hand. While gripping, lightly draw the leader out at a 45-degree angle to the spindle.

Activate the wheel by slowly pressing the accelerator. If the rolag is held in a position to allow the leader to spiral around the spindle and then to slip

off the tip as it slips, you will see and feel a twist run into the drawn fibers. Allow this twist to join the ends.

Once you have joined the leader to the rolag, the left hand is used to draw out the fibers and the right to assist in smoothing the draw and controlling or stopping the twist from reaching the rolag until it is drawn properly.

The drawing out, unwinding and winding onto the shaft base is then repeated. The spun yarn builds up in a cone on the shaft and care should be taken during the winding on that the yarn package builds up evenly.

When you have spun a complete rolag, open the twist on the wound-on yarn end and join another rolag as you did originally to the leader yarn.

When the shaft is full of spun yarn it is then wound off onto a niddy-noddy or into a ball as desired. To speed up this step, run the spindle backward by removing the rubber band at the motor, putting a half-twist in it and replacing.

If you haven't spun before, it will be helpful to read various books on spinning as the techniques of using a leader, piecing the yarn and drawing out are basically the same for spinning on a wheel, drop spindle or this device.

References:

1. Fannin, Allen, HANDSPINNING - ART AND TECHNIQUE, New York, Van Nostrand Reinhold Co., 1970.
2. Simmons, Paula SPINNING AND WEAVING WITH WOOL, Pacific Search Press, Seattle, Wash., 1977.



# CONVERGENCE

The Colorado Fiber Show in conjunction with Convergence '78 at Colorado State University, Fort Collins, Colorado will be held June 21 - July 19, 1978. Entries due April 29, 1978. Open to all Colorado fiberists. Exhibition divisions: Woven Fiber Structures, Non Woven Fiber Structures and Functional. Jurors: Lia Cook, Alice Parrott. Awards entry fee \$5.00, maximum 2 entries.

Write: Convergence '78, Handweavers Guild of America, P.O. Box 4271, Boulder, Colorado 80306.

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THE WEAVER'S JOURNAL is hunting for out-of-print periodicals for their research library. If anyone knows of available copies of Handweavers and Craftsmen, Shuttle Craft Guild Bulletin or others please write to us at 1900 55th Street, Boulder, CO. 80301.

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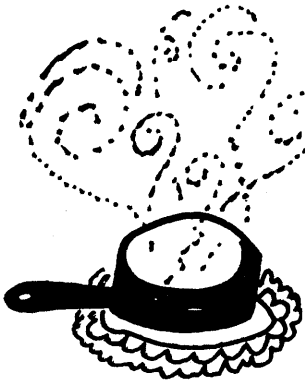
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# HOLDERS of HOTPOTS... contest & show



As a special event during the HGA CONVERGENCE IN COLORADO, "The Weaver's Journal" is sponsoring a contest and show of HOLDERS OF HOTPOTS. The potholders can be in any technique except needlepoint and may range from flat pieces to oven mits. Use your creativity and imagination to design a textile whose function is to hold hot pots!

The contest is open to everyone, but only subscribers to The Weaver's Journal are eligible for first prize. The first prize will be a wall-hanging. The second prize is a print by Harrison Begay and the third prize will be a two year subscription to The Weaver's Journal.

The judging will be done on June 15, 1978, by the staff of the journal using a point system. No entries will be accepted after that date. Mail or hand deliver your entry (s) - up to 3 per person - to "The Weaver's Journal", 1900 55th Street, Boulder, CO 80301. The entries will be returned to you in the same way that they were delivered, on July 15th.

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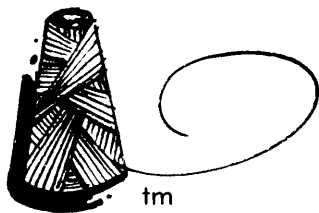
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