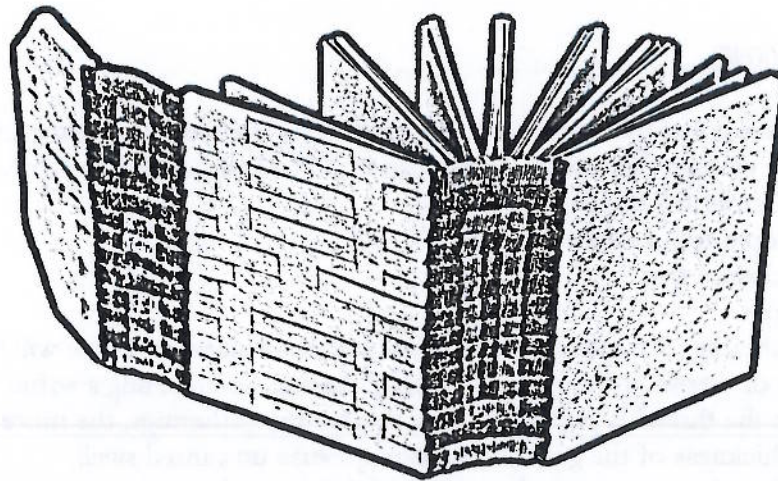


Twined Binding

designed by Roberta Lavadour, 2007



IN THE MOST widely known form of traditional weaving, threads are passed alternately over and under warps (the supports that run lengthwise in a weaving). In contrast, **twining** employs two or more elements (threads, cloth strips, etc.) that twist around each other between the warps. Twining is a finger-weaving technique that is sometimes considered more primitive than other weaving because it pre-dates the loom and is difficult to mechanize. The finished work is also considered more stable. A technique called “full turn” twining uses two or more different colored threads to create patterns.

By incorporating a full turn between two warps, one color will appear on the surface of the woven item and the other color will appear on the reverse side. The color scheme can be altered at any point by inserting a regular half-turn to reverse the color order.¹

This weaving technique was/is used by many cultures in North and Central America, the Middle East and New Zealand. In the Columbia River Plateau region of Oregon and Washington the indigenous tribes used baskets crafted from dogbane, cattail, corn husk, bear grass, canary grass and other materials to transport and store goods.

Mary Dodds Schlick, who lived on the Colville, Yakima and Warm Springs reservations, is considered an authority on Plateau basket twining. *“Schlick took a special interest in reviving the art of full-turn twining, a rare weaving method mastered by basketmakers of the mid-Columbia. The last known maker of the traditional Wasco-style cylindrical baskets, Louise Van Pelt Sconawab Spino, died in 1971. Schlick first studied old baskets that had been preserved in private and museum collections, and after much trial and error, learned the basics of the full-turn twining technique.”*² Through the Traditional Arts Apprenticeship Program of the Oregon Historical Society Schlick worked with Wasco tribal members who learned the techniques and have revived the distinctive traditional designs of the Wasco bags.

Joey Lavadour (*Walla Walla*) is part of an unbroken chain of basket weaving on the Umatilla Indian Reservation, where he was born and raised and lives today. Taught to twine baskets by Walla Walla elder Carrie Sampson, he has been instrumental in continuing the tradition and leading a revival in the art of basket twining. He works mainly with Pendleton wool and his baskets have been exhibited in contemporary art galleries as well as venues like the National Museum of the American Indian.

His work was the inspiration for this structure.

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MATERIALS:

Davey Board (.098)

Cover paper

Choose a cover material that is rigid and durable enough to weave around, yet flexible enough for working your turn-ins. The flax paper from University of Iowa Center for the Book is ideal.

Decorative endpapers, if desired

Paper to line closure flap

Text block paper

Fat gatherings are easier to work with, but not necessary. There will be two thicknesses of thread in the gutter of each gathering, so choosing a softer paper that will absorb the thread is preferable. The thinner the gatherings, the more the accumulated thickness of the gutter threads may cause unwanted swell.

Waxed linen thread - two contrasting colors of the same ply count

Two (2) small, strong magnets (optional)

As 1/8 inch thick magnets are about .027 inches thicker than most Davey Board, if you use this size, laminate a sheet or two of cardstock to the cover boards.

PVA or PVA/paste mixture

Four (4) needles

Scrap chipboard for punching template

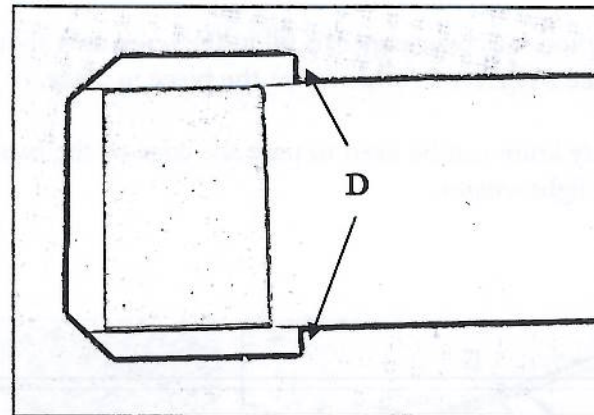
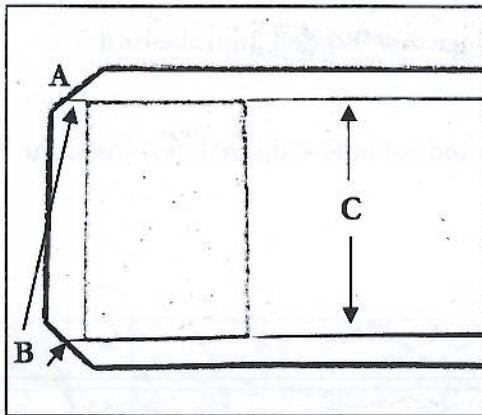
PREPARING THE MATERIALS:

1. Fold gatherings and put under light weight overnight. Resist the urge to trim the foregdes of the gatherings, as fat sections make for an unattractive stair-step on the text block of the finished book. Endpapers may be tipped on or hooked, if desired.
2. Cut cover boards and flap piece to the exact height of the gatherings. Make cover boards just *slightly* wider – no more and 1/16 of an inch - than the folded gatherings. *NOTE: the weaving creates a natural round in the spine, pulling the gatherings away from the foredge.* Cut flap piece to 1/2 to 1/3 the width of the cover boards.

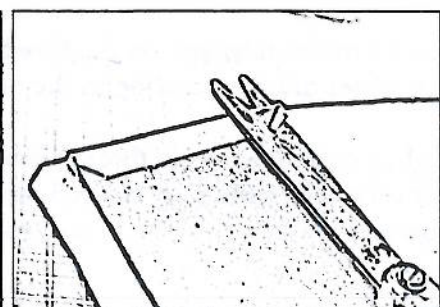
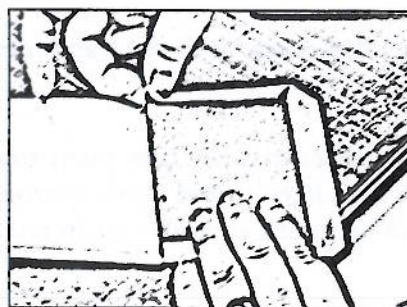
NOTE: Since the handmade flax sheets don't have much of a discernable grain, if the papers making up the final paste downs, whether they be simply the first and last pages of the text block or decorative sheets, have a strong pull, you may want to line the other side of your boards with a similar paper.

3. Mark the outline of the placement of the magnet and remove that portion of the board with the utility knife. Insert the magnet - should be a tight fit. (*Note: Magnets are not shown in illustrations*)
4. Cut the cover paper 1 inch taller than the cover boards and to a width equal to that of the two cover boards, plus the flap piece, plus 2x the thickness of the text block, plus 3 inches.

PREPARING THE WARPS

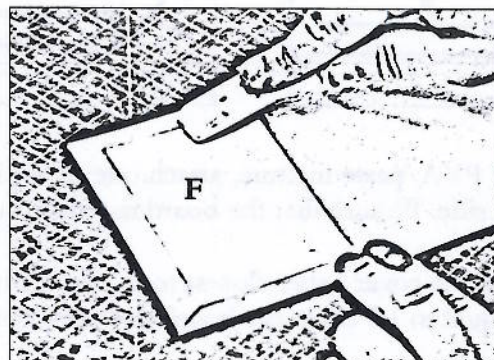
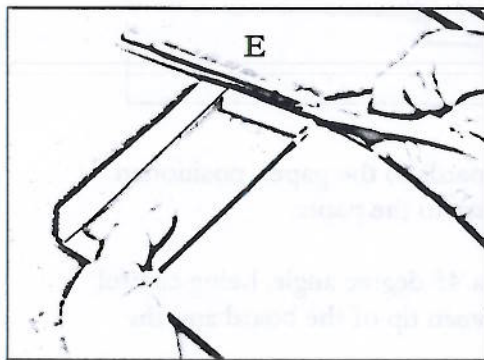


5. Using straight PVA or PVA/paste mixture, attach one of the boards to the paper, positioned 1/2 inch from the left side. Be sure that the board remains square to the paper.
6. Trim off the corners of the cover paper closest to the board at a 45 degree angle, being careful to leave cover paper equal to 1.5 times the board thickness between tip of the board and the cut edge. (A)
7. On the side with the small turn-in flap, use a triangle and utility knife to make a small cut at the top and bottom of the cover paper from the edge of the paper exactly to the corners of the board. (B)
8. Using a large triangle and a utility knife, cut along the top and bottom of the long side of the cover paper, using the top and bottom edge of the boards as your guide. (C)
9. Make a perpendicular cut about 1/2 inch beyond the edge of the board to remove the top and bottom strips. (D)
10. Apply straight PVA or PVA/paste mixture to the top turn-in, bringing the small flaps that extend beyond the board edge around the side of the board and pinch. Trim along the top edge of both sides of the board to remove the extra little flap of cover paper. Repeat on the bottom turn-in.

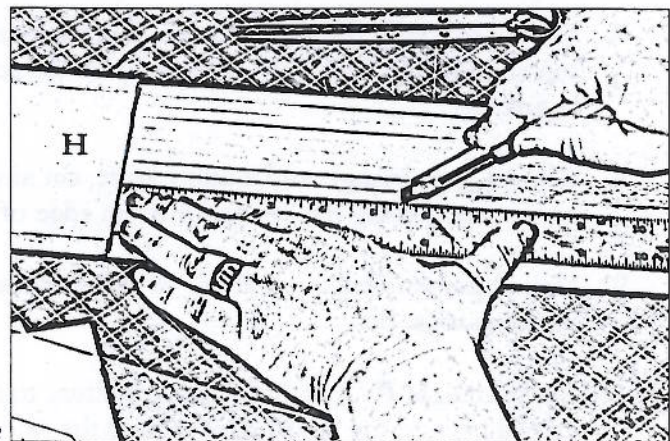


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11. Apply adhesive to the remaining turn-in, use the round end of a bone folder to glove the cover paper along the board edge, trim the ends of the flap slightly, and finish adhering the flap. (E)
12. Cut a piece of cover paper to fill in the open area slightly larger than needed, trim the turn-ins to make a perfect fit and adhere the piece in place. (F)
13. A utility knife can be used to pare the edge of the turn-in to reduce bulk if desired. (G) Press the board under light weight.



14. Using a triangle, score two vertical lines, one near the board and one near the other side of the paper
15. Using calipers, divide the paper into the desired number of warps. It doesn't matter if it's an odd or even number. Punch small guide marks into each of the scored lines.
16. Cut the strips, beginning at the board edge, making several passes with the utility knife each time to minimize drifting. (H)



can do repair on rear w/ thin tissue if mis cut

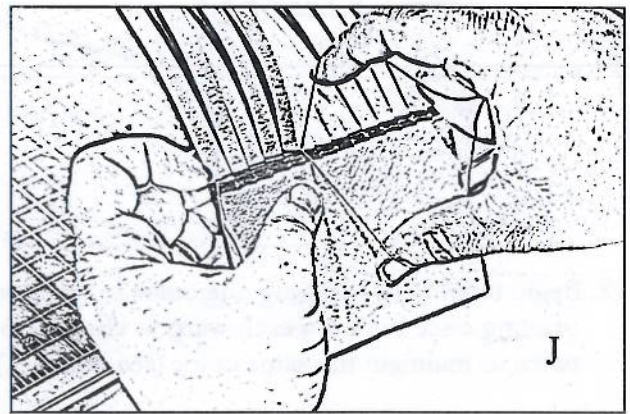
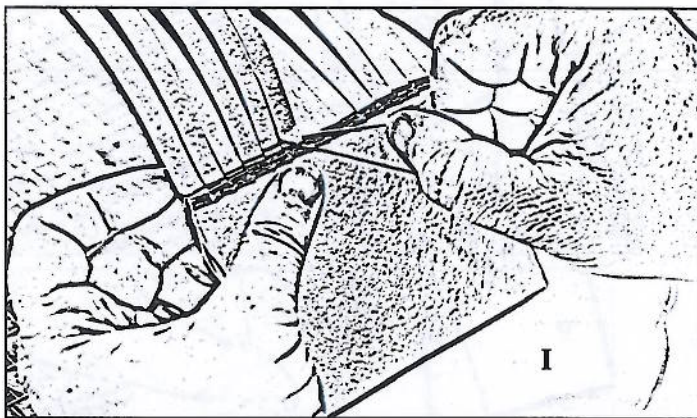
17. Use the cut strips to create a punching template for the gatherings with an even number of sewing stations and punch the gatherings using the template.
18. Place a medium weight on the foreedge of the text block stack and measure the distance from the center of one gathering to the next.
19. Tightly coil your sewing thread around a ruler to gauge how many rows should be woven between each gathering. Note: 3 ply waxed linen thread yields approximately 8-9 rows of weaving per quarter inch of warp. The twined rows between gatherings are in multiples of two.

TWINING

IN CONTRAST TO basket twining, where two strands of contrasting colors would be used for a design like this, the binding employs four strands that alternately travel in and out of the sewing stations as the gatherings are added. This technique differs also in that instead of working around a basket continually, the weaving direction will be changed at the head and tail of the book with each added row.

If working with a complicated design, map it out digitally or on graph paper so that there's a pattern to follow as you work.

The basic twining method is as follows. *Note that this illustration shows several rows already worked.*

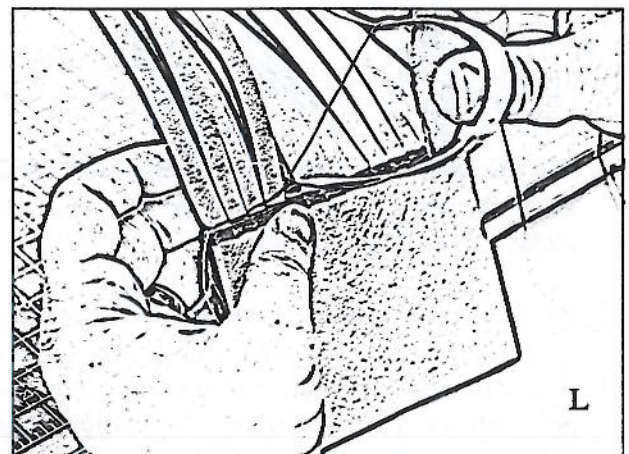
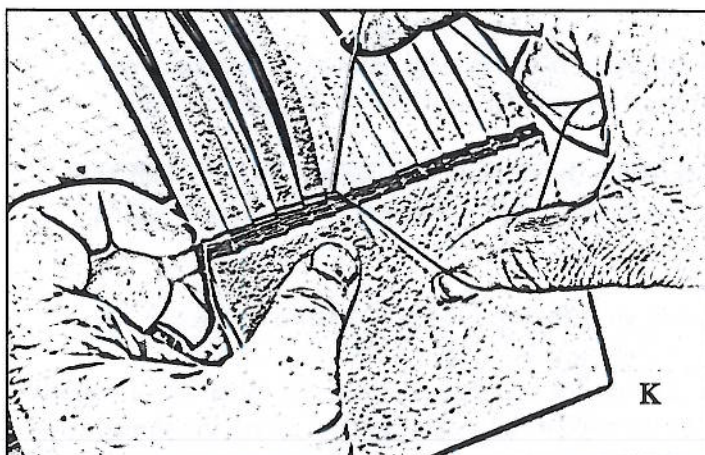


Keeping the tension even (I), twist the two threads in a counter-clockwise motion (J). This “half turn”, will result in a different color showing on the front than on the previous stitch.

To maintain the same color, twist the two threads again in a counter-clockwise motion (K), creating a “full turn”.

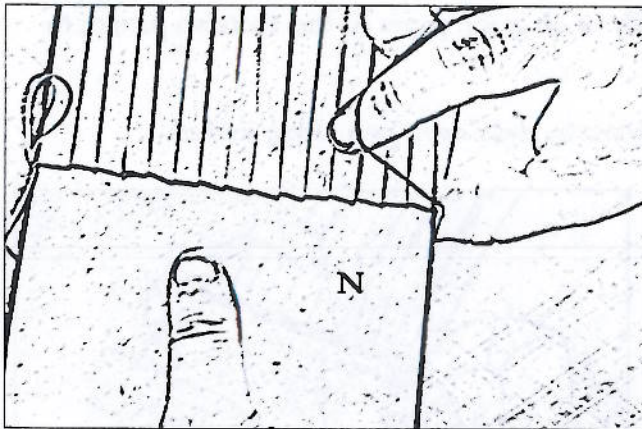
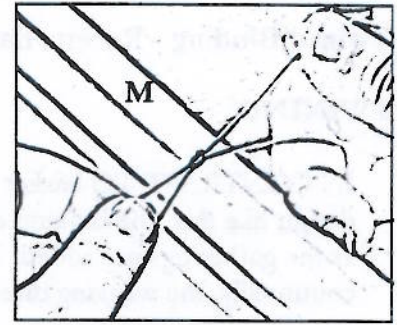
After the half or full turn, use your thumb to bring the warp forward through the thread loop (L).

After some practice, it is easy to feel when a stitch pops into the correct place so that only the color desired shows on the front of the woven pattern.

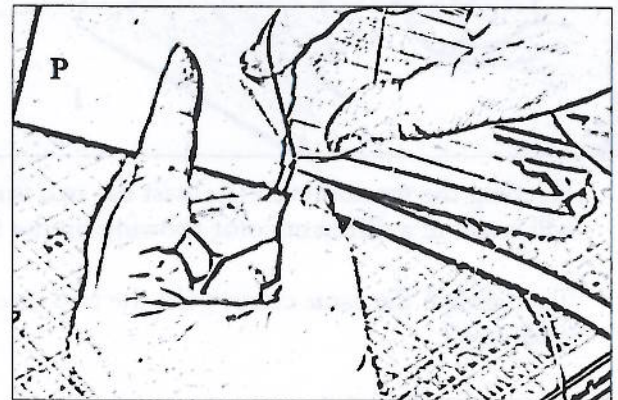


THE BINDING...

20. Begin with two strands of contrasting color waxed linen that are two times your arm's length. Thread a needle on to each end of each strand, and lock on the needles.
21. With the strands together, fold the thread into two halves and tie a small slip knot at the center. (I) This will hold the threads in place as you begin to twine.



22. Begin twining by bringing one color to the front, twisting once between each warp to change color, twice to maintain the same color (see illus. I-L).
23. To change direction, make one twist of the threads off the end of the last warp, bringing the top thread back over the top of the warp and the contrasting thread underneath the warp as the board is turned around 180 degrees (N-P). Pull the bottom thread until the top thread loop is between the first and second warp.



24. Twine two rows, using an awl to compact the stitching after they are completed. Pull the slip knot loose and tie off those two ends in a half-knot. (Q)

NOTE: Every other row will be twined with the board on top and warps on the bottom so that you're always working to the right (or left, if left handed).

25. Use the same technique described in step no. 23, catching the threads you tied off with the half knot along the warp, and change direction, turning the board around 180 degrees. These threads will be picked up in instruction no. 27
26. Twine as many pairs of rows as needed before adding your first gathering (usually 6 or 8 total)
27. Twine down to the first sewing station, then pass the needles and threads from the other set of strands (see instruction no. 25) under the wrapped edges to the top of the weaving rows. Bring the threads inside the gathering and exit at the first sewing station between the warps. Pass the other set of threads through the sewing station to the inside of the gathering and exit at the next sewing station.

all 4 have needles

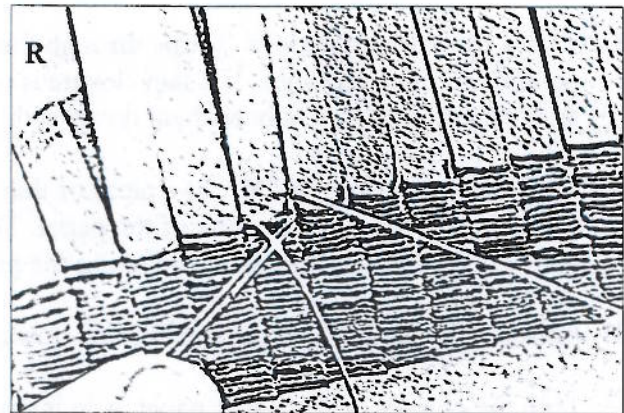
*weave w/outside thread
attach signature w/inside thread*

to add twine -
 - weavers knot on inside, hide ~~ends~~ ends under or inside signatures

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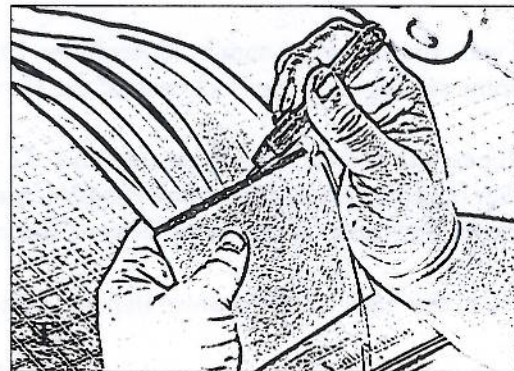
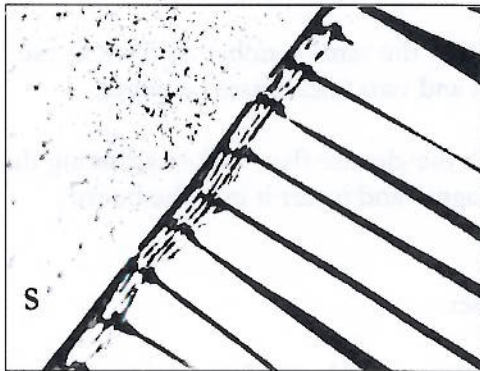
28. Twine the outer threads down to the next sewing station, enter the sewing station and exit at the next sewing station.

29. Continue to twine to the next sewing station, exchanging the pairs of threads at the sewing stations. Pulling the new twining threads out of the way before entering the sewing station (R) helps prevent the splitting of the threads.



30. Depending on the gauge of your thread and the thickness of your gatherings, you will have 2, 4 or 6 rows of twining between the addition of each gathering. Before adding each gathering, move the extra threads under the head/tail wraps to the top of the row.

after addy each signature, roll/fold structure on bench to finesse into 90° board to spine



NOTE: The back side of the twining, when done properly, will have a pattern that that mimics that on the front with the colors reversed. On stretches of full-turn twining, there will be short threads of the running along the line between the warps (S).

31. Continue adding gatherings and twining rows as needed. Use an awl to compact the stitching after each row is added (I). End with the number of rows of twining that you started with (usually 6-8). Tie off ends and thread the strands under the text block, snipping off at the other side.

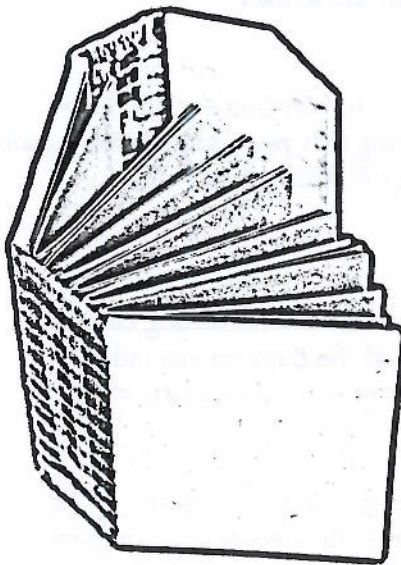
ADDING THE BACK COVER

32. Cut a piece of cover paper 2 inches larger than your cover boards. Place the remaining cover board in the center and use the round end of the bone folder to fold the flaps up around the board. These lines will provide a template for cutting the slits that the sewing supports will be threaded through.

33. Design the weaving pattern for the sewing supports/warps and score more lines lightly on the back of the cover paper that are parallel to each other. Use the spring dividers at their original setting to mark the slit guides. Make sure that slits are staggered. If a flap closure is being added, the sewing supports/warps should exit from staggered slits near the foredge.

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35. Weave the sewing supports/warps through the cover paper, pulling the paper as close as possible to the spine edge. If a flap closure is not to be used, use the utility knife to pare the ends of the strips and adhere them down with PVA
36. Apply a light coating of PVA to a piece of thin Japanese tissue the size of the cover paper and lightly burnish it onto the back of the paper. This lining will prevent adhesive from seeping through the weaving slits when adhering the paper to the board.
37. Adhere the board into place and burnish down well.
38. Trim the corners of the cover paper as in instructions no. 6, 7 and 10.
39. Begin the foredge twining with two strands of contrasting color that are an arm's length long, tied together with a square knot. Begin twining at the second warp, moving back to the beginning and starting a new row. As you twine, align the two loose ends with the second warp to hide them under the stitching.
40. Twine the flap as shown in illustrations I through L, using the same number of rows as the spine sewing plus the thickness of the flap closure and two thicknesses of paper.
41. Repeat the instructions from steps no. 32 - 38 to attach the closure flap. Before adhering the flap board in place, determine the placement of the magnet and insert it into the board.
Note: Be sure to check to polarity of the magnets.
42. Fill in the back of the closure flap and apply lining paper.
43. Using waste paper to protect the text block, apply adhesive to each endsheet and paste down shut. Leave the book under light weight (with closure flap open) overnight.



This binding is open to endless variation in the paper weaving patterns used on the boards and the closure methods used. (A closure of some sort is recommended because of the natural yawn of the gatherings that most exposed spine bindings exhibit.)

What was presented here as the front cover may be used as the back cover, separate paper strips may be woven into the cover paper of the initial board to create matching textures, woven straps may replace magnetic closures, closure flaps may be cut to different shapes and endless other devices may be employed.

Photographs of different binding variations can be found at www.missioncreekpress.com

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1. **Sandals of The Anasazi** (www.umnh.utah.edu/pageview.aspx?id=15891)
2. **The Oregon History Project, created by the Oregon Historical Society**
(www.ohs.org/education/oregonhistory/historical_records/dspDocument.cfm?doc_ID=A3271FA8-AD29-0443-4A5F3E85F24F2BFE)

OTHER REFERENCES AND RESOURCES:

Columbia River Basketry: Gift of the Ancestors, Gift of the Earth
(University of Washington Press, 1994) by Mary Dodds Schlick
ISBN-10 0295972890 / ISBN-13 978-0295972893

Royalwood Ltd.(www.royalwoodltd.com)
Waxed Linen Thread

Amazing Magnets (www.amazingmagnets.com)
1/2 x 1/4 x 1/16 Item Number P063BD or 1/2 x 1/4 x 1/8 Item Number P125BD

UICB Paper Research and Production Facility
(www.uiowa.edu/~ctrbook/store/handmadepaper.shtml)
PC4 Flax Paper Case paper
319-335-4410 handmade-paper@uiowa.edu

Bookbinding and the Conservation of Books
A Dictionary of Descriptive Terminology
Matt T. Roberts and Don Etherington
(<http://palimpsest.stanford.edu/don/don.html>)

The Beginnings of Tapestry Weaving
Presented by Dr. Elizabeth Wayland Barber
Second Annual GFR Lecture
March 11, 2000, UCLA Fowler Museum of Cultural History, California
(http://tapestrycenter.org/resources_lectures.php?page=showcomments&id=17)

