Multidimensional Handwoven Cuffs

GIOVANNA IMPERIA

As a jewelry designer, I have always been intrigued by the tactile properties of materials such as fiber and metal in my search to produce highly textured and organic shapes that redefine what body adornment is all about. These cuffs are a good example of the way I work: they combine three techniques—shibori, cloqué, and felting—with one of my favorite materials, linen singles, woven in a fancy twill.

Who says that jewelry has to be hard? What about creating interesting soft jewelry? What would it look like? How would it drape on the body? Is it possible to make something that is three-dimensional yet still retains the draping capabilities of two-dimensional materials?

My attempt to answer these questions has led to work that is both surprising and challenging. These experiments can be scaled up into traditional textiles such as scarves, shawls, and garments. I often start with a scarf as a way to explore materials and processes and then scale it down into jewelry. I also tend to put on long warps and weave several pieces on a single threading, changing the appearance of each piece by changing the weft color or tie-up or treadling. The amounts listed here are for a single bracelet. If you wish to experiment as I do, add more yardage and enjoy!

Giovanna Imperia *of Katy, Texas, pushes the boundaries of jewelry making by exploring the tactile and organic nature of fiber.*

Weave structure and materials

I find that the best weave structures to use for these pieces are simple ones. However, I do prefer twills to plain weave, because twills have longer floats that allow the fibers to move more freely, especially during the cloqué process.

In this project, I used a point-twill draft that creates furrows so that the shibori pleats follow the furrowed structure and appear more organic. While the draft for this project used sixteen shafts, you can choose almost any draft. You can even use plain weave—just keep in mind that the final appearance of your fabric is likely to be different.

A lot happens to the handwoven cloth *after* it has been removed from the loom. Lightweight yarns and loosely woven cloth yield better shrinkage with cloqué as well as better pleating when combined with shibori. I allow for a shrinkage of forty to sixty percent in the weft and twenty to forty percent in the warp.

Shibori

Traditional Japanese shibori is the tying or pleating of cloth with handsewn gathering stitches to produce dyed or textured patterns. When combined with chemical processes like cloqué, shibori can produce permanent pleats in the cloth. The shibori must be done before the cloqué.

I prefer to use traditional Japanese shibori, which is done after the cloth is off the loom rather than loom-woven shibori, because the Japanese method offers more flexibility in terms of design and three-dimensional effects. This project uses the "mokume" stitching technique. Mokume means "wood grain" and is descriptive of the final appearance of the cloth.

Cloqué

Cloqué is a French term that means blistered. It refers to the process by which cellulose fibers like cotton, ramie, linen, and bamboo tend to shrink, twist, and distort when exposed to lye (sodium hydroxide). Instead of having a flat surface, a cloquéd fabric has a very bumpy one. The lye used in the cloqué process alters the structure of cellulose fibers placed in it, so bumps or pleats made this way are permanent.

Cloqué is not fulling or felting. In cloqué the heat and extreme agitation of fulling are not required, and the fibers do not break down or lock into each other. Each individual thread remains separate, although it may have shrunk or twisted onto itself. Linen tends to have a stronger reaction to lye than other fibers, so while this project can be executed with any cellulose fiber, the shrinkage and the surface appearance will be different.

Felting

Felting helps add body to a handwoven bracelet without affecting the elasticity of the shibori/cloqué process. It is important to integrate the felt into the design by using it with restraint to

RESOURCES FOR CLOQUÉ

Equipment and supplies for cloqué

- Red Devil lye.
- 56% acetic acid or white vinegar.
- Measuring spoons, liquid measures, candy thermometer, and plastic spatulas or chopsticks —all strictly reserved for use with cloqué or other chemical processes and stored away from kitchen utensils.
- Metric scale.

Protective equipment

- Goggles, apron, rubber gloves, and respirator.

Plastic containers

- 1 container for lye bath and 1 container large enough to hold lye bath container and ice or water to cool it.
- 1 container for rinse water.
- 1 container for acid (neutralizing) bath.

Sources for equipment and supplies

Rubber gloves, Red Devil lye, and white vinegar are available from grocery stores; scales, acetic acid and other protective equipment from chemical supply companies and some dye vendors (PRO Chemical & Dye no longer ships acetic acid); plastic containers, measuring spoons and cups, and stirring equipment from discount stores (Wal-Mart, Target, K-Mart).

PROJECT AT-A-GLANCE

Weave structure
Advancing twill.

Equipment
8-shaft or 16-shaft loom, 9" weaving width; 15-dent reed; 1 shuttle.

Yarns
Warp: 16/1 linen (5,525 yd/lb, Bockens Lingard), green #1028, 405 yd (1 3/16 oz).
Weft: 16/1 linen (5,525 yd/lb, Bockens Lingard), purple #485, 116 yd (⅓ oz).

Notions and other materials
Crochet cotton, size 8 or 10, and handsewing needles for shibori stitching. Wool roving (preferably not merino), violet or desired color; felting needles; two-needle tool (optional); felting foam; freshwater "stringing" pearls, dyed purple.

Yarn and material sources
16/1 linen is available from Nordic Studio. Crochet cotton and handsewing needles are available in craft and fabric stores. Wool roving is available from Lynn's Texas Fiber (www.texasfiber.com) or FeltCrafts (www.feltcrafts.com); felting foam needles and holders from FeltCrafts. Stringing pearls (both freshwater and glass pearls) are available from Fire Mountain Gems (www.firemountaingems.com).

Warp order and length
270 ends 1½ yd long (allows 4" for take-up and 36" for loom waste. Allow an additional 18" warp length for each additional bracelet).

Warp and weft spacing
Warp: 30 epi (2/dent in a 15-dent reed. Width in the reed: 9".
Weft: 30 ppi. Woven length (measured under tension on the loom): 14".

Yarn and material sources
16/1 linen is available from Nordic Studio.

Finished dimensions
After shibori pleating, cloqué, and hemming, amounts produce fabric for one bracelet 3½" × 9" unstretched. Shrinkage is 20% to 40% in the warp direction and 40% to 60% in the weft direction.

STEPS FOR WEAVING THE BRACELET

Step 1 Wind a warp of 270 ends green 16/1 linen 1½ yd long. To minimize abrasion on the singles linen, warping the loom back to front with two crosses is recommended. (For specific warping directions, see Weaving Resources at www.handwovenmagazine.com.)

Step 2 Thread the loom following the Project at-a-Glance and Figure 1 or 2. The 8-shaft draft includes 2 floating selvedges. To use floating selvedges with the 16-shaft draft, unthread the first and last threads from the heddles before sleying or tying on. Tie on to the front apron rod and weave several picks of plain weave with waste yarn. Wind a bobbin of purple linen.

Step 3 Leaving a tail for hemstitching, weave several picks following the treadling in Figures 1, 2, or 3. After weaving about ½", hemstitch around groups of 6 threads to prevent raveling during handling after the cloth is removed from the loom. Weave 14", aiming for an open weave with about 30 ppi. End by hemstitching as at the beginning and cut the cloth from the loom.

Step 4 Stitch the shibori first, using a needle and strong thread such as crochet cotton. The shibori stitches will help define the pleats that are produced in the cloqué process. To obtain the wood grain effect of mokume shibori, stitch parallel lines in two rows so that you can later gather and knot the stitches in pairs. The stitch lengths in this project follow the twill furrow pattern with short stitches where the furrows narrow and longer stitches at the top, where they are widest. For a more natural appearance after the pleats are set, do not align the stitches from row to row. Do all stitching before you gather: stitch in paired rows. Start stitching on one end of the cloth and stitch to the other; then go back to the beginning without cutting the thread and stitch the second row. Cut the thread only when the second row is completed.

Step 5 Gather the stitches tightly and knot them securely to be sure they do not open up when they are in the alkali bath. Tightly gathered stitches insure that the pleats are set permanently in the cloqué process: the lye penetrates the fabric unevenly, producing more shrinkage in the exposed areas and less in the folded areas.

Step 6 Now it's time to apply the cloqué process to the fabric. Prepare the containers for a lye bath, a water bath for rinsing, and an acid bath to neutralize the alkali following the instructions on page 5. These chemicals are very hazardous, so take particular care to follow all safety precautions.

Immerse the fabric in the lye bath. It is not necessary to agitate the fiber, but make sure the fabric remains fully immersed in the lye solution. Use plastic spatulas or disposable chopsticks to push the fabric down. *Never* put your hands into a lye bath, either with or without gloves. If you have used the 30% lye-to-water solution, the bulk of the shrinkage will occur in the first few minutes of the immersion. With weaker solutions, the fabric will need to soak at least 15 minutes or, more likely, 30 minutes.

When the desired shrinkage has been achieved, carefully remove the cloth from the lye bath, making sure you don't splatter any of the liquid on yourself. Place the cloth in the container with the water and rinse well. Place the cloth in the vinegar solution to neutralize any residual lye. The fabric will feel slippery until all the lye has been neutralized. Once the slimy feel disappears, rinse the fabric again in running water and allow to dry.

Step 7 When the fabric is dry, remove the shibori stitches. Wrap the cuff around your wrist and mark seamline to fit. Sew the seam and trim seam edges.

Step 8 Now you are ready to add some felting. Since I used violet in the weft, I needle-felted violet roving, using a 32-gauge star-bladed felting needle, rather than wet-felting it. Because this is a small surface, I prefer to work with a single needle or with the two-needle tool from FeltCrafts.

If you will be primarily felting the inside of the bracelet, turn it inside out. Place felting foam on what is now the inside (the side you are not felting), lay a bit of roving onto the bracelet, and work it into the cloth with the felting needles. Be patient. The more you work it, the denser and flatter it will be. (I tend to like to leave my felt a bit fuzzy.) Add roving a bit at a time to ensure that it fully felts and blends with the cloth. When you are happy with the felting inside, remove the felting foam and turn the bracelet right side out.

Step 9 Now you can add a few bits and pieces of felt to the outside to hide the seam and highlight some of the pleats. Stitch pearls onto the piece if desired, making sure that the thread is not visible. If this happens, just add a bit of felting to cover the visible stitch.

highlight some of the pleats and/or some of the colors in the bracelet.

I typically add the bulk of the roving to be felted to the inside of the bracelet, with just a bit on the outside, primarily to cover the seam. If too much roving ends up covering too much of the piece, it can detract from its overall appearance.

If possible, avoid using merino roving. While it does felt beautifully, its short, fine fibers make it somewhat harder to work with. Add roving a bit at a time to ensure that it fully felts and blends with the cloth.

Finishing touches

Pearl accents add another textural interest to the bracelet. Whether they are arranged in a specific pattern (in this project they are lined up in a row) or scattered, do not overdo them or add so many that the cloth "disappears" under them! Ready-to-string freshwater pearls come in all sizes, shapes, and colors; glass pearls are also available.

PREPARING AND USING A LYE BATH FOR CLOQUÉ

Lye generally comes in white pellets stored in airtight containers. Since this is a core component of products used for unblocking drains, it is still possible to find it in some grocery stores (Red Devil brand in the United States). Another source is chemical suppliers who sometimes sell it in a diluted form, typically, a 50% solution. This dilution is still too strong for cloqué and it must be diluted further.

Because it is an alkali derived from wood ash, lye can sometimes strip the surface color from yarns subjected to it. (I have never had this problem with linen from Nordic Studio, but other materials and and natural-colored linen have bleached somewhat.)

Lye is extremely toxic: when handling it, be very careful to protect your eyes, hands, and skin. You should also work in a very well-ventilated area, because lye emits toxic fumes. I work outside wearing apron, rubber gloves (kitchen gloves are good), goggles, and a respirator. Having a good shelf life, a lye bath can be prepared once and stored for future use. I use a container that can be securely closed and I label it clearly.

When you are preparing a lye bath, always remember to pour the lye into the water—never the opposite—to avoid splashes or other unwanted chemical reactions. Lye emits heat when it comes into contact with a liquid. Use two plastic tubs, one inside the other, to form a double container. The smaller container will hold the lye bath and the larger container will hold the cold water or ice in which the lye bath will rest.

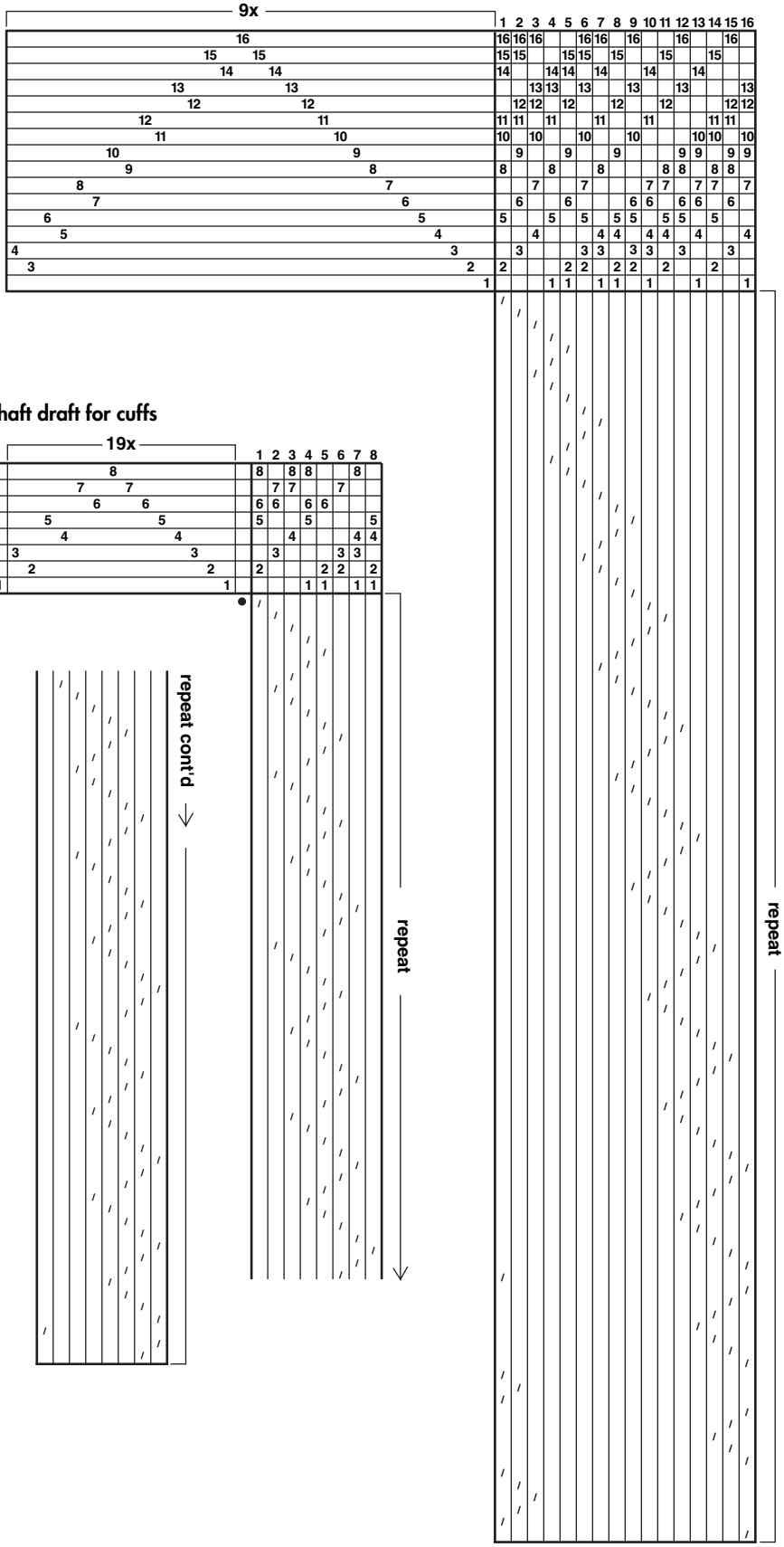
You can make a 30% lye-to-water solution, that is, 300 grams of lye for 1,000 cc of cold water. This is a fairly strong formula and it will work very quickly. For more control over the process, reduce the strength of the lye bath to 20% or even 10% and plan to soak the fabric longer.

Measure the water into the smaller container now resting in the larger container filled with ice or water. Then slowly pour the lye into the water, stirring carefully. Allow the chemical reaction to take place and let the lye bath cool to around 70° F before you add the fiber.

While the lye bath is cooling, prepare two more plastic containers, one with water for rinsing and one with an acetic acid or a vinegar solution for neutralizing the lye in the fabric (mix 2 gallons of water with 50 cc of 56% strength acetic acid or use regular white vinegar, the kind available in grocery stores, at 11 tablespoons per gallon). Acetic acid has a strong odor and is somewhat toxic. Therefore, when you handle it, be sure that you are wearing your gloves, goggles, respirator, and apron. Discard the acid bath after use.

To discard a spent lye bath, dilute it first with additional water, pour it carefully down the drain, and then follow it with an acid bath to neutralize the drain.

2. 16-shaft draft for cuffs



1. 8-shaft draft for cuffs

3. Peg plan