

Whipcord Braiding Bobbins

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SUMMARY

Braiding is a common method to create a strong cord from several lighter threads. However, it can be difficult to braid with only one's fingers to control the cords, and the difficulty increases as the length of the threads increases. This problem led to the development of bobbins, which could be used to wrap the length of the thread into a neat package that was easier to manipulate. When more thread was needed, it could be unwound from the bobbin in a controlled fashion. My research into Anglo-Norse woodworking led me to conclude that a lathe would be an ideal tool on which to create such bobbins, as there is a great deal of evidence for lathe-turned cups, bowls, and other wood objects. In the process of researching and making these bobbins, I learned a lot about period lathes, lathe tools and techniques, and period wood finishing. The result was this set of bobbins my lady can use.

Historical Documentation

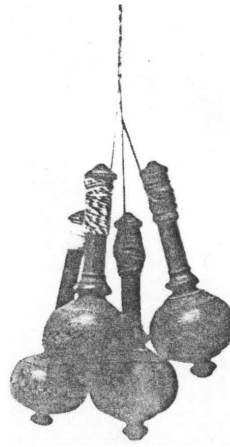
Bobbins

While we were visiting the Lehre Research Center in Denmark, my lady and I saw these braiding bobbins in the Weaver's Hut of the Iron Age Village. This set of 4 bobbins was being used to braid wool in a whipcord pattern. Each bobbin was approximately 10 inches long and 2 inches in diameter. While their construction is crude, they were remarkably effective. Their faceted sides prevented the bobbins from moving when they were left to hang unattended, and the lip at the top of each bobbin prevented the cord from unwinding. At that time, I decided that I would make something similar for my lady's use. However, making the bobbins on a lathe would give a better end result than these rough-hewn examples, if I could show that it was done in period.



I was not able to find any artifacts that could be identified as braiding bobbins from the Viking Age. Wood does not preserve well except under certain moisture or chemical conditions. Moreover, a wooden object that was no longer useful was most likely to become fuel for the evening fire. While I found archeological artifacts identified as bobbins (Morris, 2335), these were narrow and pointed on the bottom, of a form more appropriate to tapestry weaving.

In Margrethe Hald's book, *Ancient Danish Textiles From Bogs and Burials*, she discussed the use of braiding bobbins in much detail. They were used in sets of four to create the braid pattern most commonly known as whipcord. The bobbins she illustrated (page 237) were much more finely made than the reconstructions we had seen, and she did not describe the origin or time period of these artifacts. The bobbins Hald showed were clearly made on a lathe, resulting in bobbins that look better, are more comfortable to the hands, and pose less risk to the yarn through snags. They also have larger diameter to their bottoms, around 8 cm, resulting in much more weight.



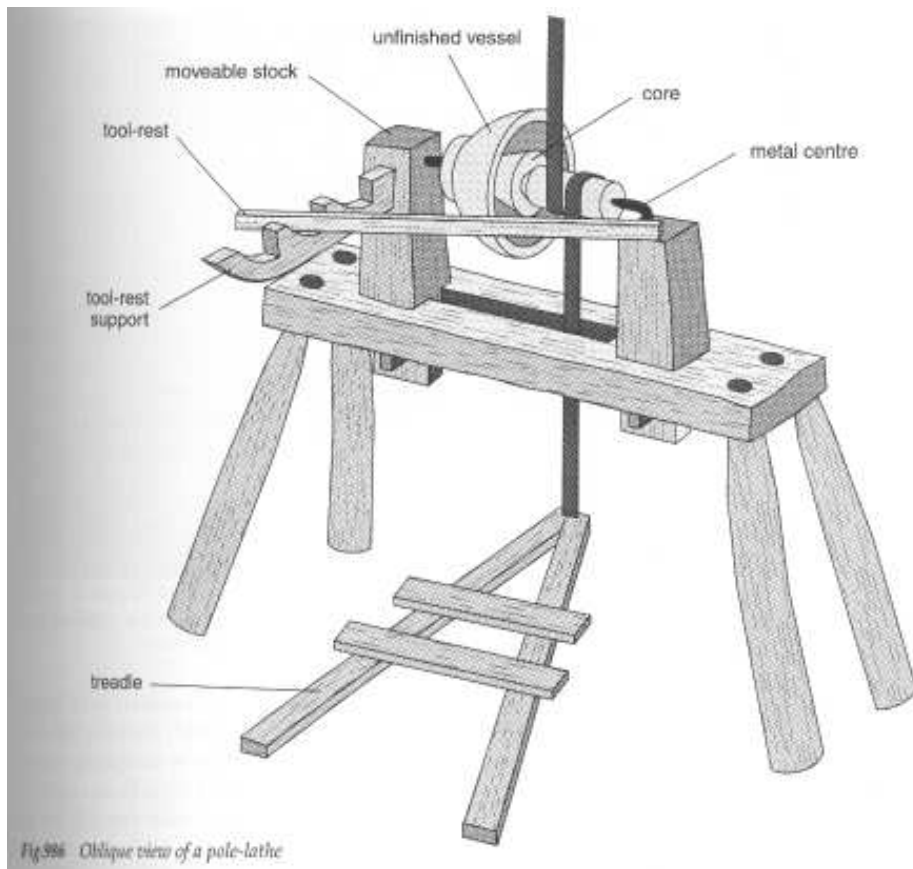
Hald stated that the art of whipcord braiding using bobbins has been a traditional one in Denmark back to prehistoric times (240). While whipcord braid can be done by hand, the use of bobbins allows very long cords. Long cords braided in the whipcord pattern were found all the way back to the Iron Age, so it is reasonable to conclude that braiding bobbins like this were used in Scandinavia in the Viking Age.

Woodturning

Morris' book, *Wood and Woodworking in Anglo-Scandinavian and Medieval York*, describes the excavation, preservation, and classification of thousands of wood artifacts from the Viking and Medieval period, found at the Coppergate site in York. A majority of these artifacts were tools, waste, and products from the art of woodturning. The evidence suggests that the lathe was most commonly used for plates, bowls, and cups (2165), from a dozen species of trees. There were also a variety of tools and tool handles made on these lathes. No objects from this excavation could be positively identified as braiding bobbins.

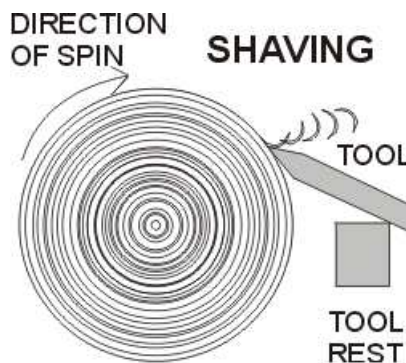
The lathe itself is an expansion of the concept of bringing the work to the tool, by spinning the wood while the tool remains relatively stationary. An offcut of wood can be clamped between the centers in a way that allows it to spin between two sharp metal points called "centers," one fixed and one movable to allow the clamping action. Then, a leather strap is wrapped around a narrow portion of the wood to cause it to spin. This strap is tensioned and powered either by a foot pedal and a springy green pole, or a bow-like apparatus. Finally, the craftsman applies his tools to the spinning wood to gradually cut it to the desired shape.

The illustration shows a schematic of the pole-lathe built and tested by Morris (fig 986). Her reconstruction is based on experimentation and the one surviving artifact, a tool-rest support identical to the one shown in the drawing. What is not shown is the pole, which is 12 feet long and rests on a bipod. The period lathe is less efficient than its modern counterpart for two reasons. First, the reciprocating action dictates that the tool can be applied only on the downstroke. Second, a portion of the wood is used to engage the belt, and becomes waste product when the core is cut from the finished item.

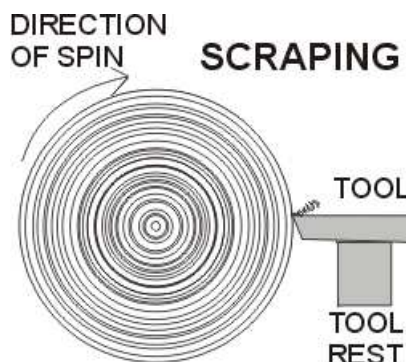


The lathe is worked by using a series of gouges and chisels similar to but larger than those used in woodcarving. Because the work is mechanically moved and the tool is relatively stationary, there is a greater risk of error and greater care is required. Depending on how the tools are used, the craftsman can either shave or scrape the work piece.

Shaving refers to using the cutting edge of the tool to cut away thin shavings of wood. It is relatively difficult and risky, but produces a fine smooth finish. The cutting edge is held at a very slight angle to the angle of the wood at the point of contact. Too deep of an angle cuts too quickly, and either tears away the wood or pulls the tool from the artisan's hand. Too shallow of an angle causes the tool not to cut at all. In addition to producing a smoother finish, shaving can remove material very quickly if done properly. Shaving is shown in my drawing to the right.



Scraping refers to placing the cutting edge perpendicular to the wood surface to scrape away wood powder, with the opposite advantages and disadvantages to shaving. This works better if the tool used for scraping has a wire edge oriented opposite the direction of spin of the wood. Scraping in this context, i.e. on a lathe, should not be confused with using a scraper as part of the finishing process, which is discussed below. Scraping on a lathe, while functionally similar, happens so quickly that it does not generally result in a smooth surface because the cutting action is more blunt and tends to tear the wood fibers as much as it cuts them. Scraping removes material relatively slowly and is less prone to error or injury than shaving. Scraping is shown in my drawing to the right.



Calipers are capable of reaching around an object to make a precise measurement between two points. They were the logical choice of tool to measure the wood during the turning process, in order to achieve a desired size, for example to create a matched set of objects. I saw several calipers of forged iron among a set of carpentry tools from the Viking Age during my visit to the Danish National Museum in Copenhagen.

The majority of turned wood artifacts bear little decoration, usually just a pattern of incised lines done while the item was still on the lathe. Some had additional decoration carved into them after the turning was done.

Given the wide variety of turned wood items found at Viking Age Coppergate, which was settled by the Norse at the time, it is reasonable to assume that braiding bobbins could also have been produced on a lathe in Viking Age Scandinavia.

Finishing

Finishing the bobbins would require smoothing the surface sufficiently that it would not damage the thread or yarn. Period abrasives include many different materials and techniques. Theophilus describes smoothing with fine sand and cloth (152). He describes final polishing with a cloth covered in chalk (102), powdered clay tiles and water (128), or saliva-moistened shale (115). Biringuccio describes smoothing with cane dipped in powdered pumice, and polishing using tripoli powder (366). Clearly, there were many abrasives available in period, chosen by their availability and relative effectiveness. Since some of these materials mentioned by these authors can stain wood, the likely method would be planing. I saw many wood planes in the Danish National Museum, whose form was not substantially different from the modern plane in my workshop. Planing would be followed by the sand and cloth, or by scraping with the edge of a sharp knife or a tool called a scraper, which is similar in form to a razor blade.

Materials and Tools

These bobbins were intended to be small and light for use with fine yarn. Therefore, I used some scrap poplar that I had in my workshop. Poplar was available in period, though relatively rare in wood turning (Morris 2154). Its grain is smooth and even, but it has a tendency to splinter, so it has the potential to make a good turned piece while retaining a measure of challenge.

My tools consisted of a bandsaw, power lathe, block plane, chisels, sand paper, and hand files.

Method of Construction

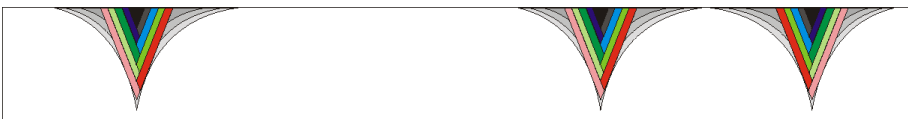
I rough cut the poplar wood into an octagonal shape on the band saw and smoothed them with the block plane. The octagon makes the initial stages of wood turning easier, and still provides a faceted surface on the finished product. This faceted surface helps prevent the bobbins from shifting when the person doing the braiding stops and lets the bobbins hang. As a side effect, the resulting octagons made it easier to find the centers of the wood for mounting in the lathe. At this stage, I was not very careful about making the octagons uniform, since the planing later would fix any irregularities. This step took about one half hour for all 4 bobbins.

Then, I put each bobbin blank on the lathe and turned the pattern into it. A braiding bobbin requires a thin neck, around which to secure the thread, and a well-defined "spool" area to wrap the thread onto when preparing to braid. This was my first woodturning project, so I chose a pattern that met these requirements and encompassed the basic two types of decoration found in woodturning. Each bobbin got a pattern of 3 grooves, two of which are spaced together to form a bead.

The pattern of cuts to achieve this is shown below. For the sake of simplicity, the drawing of the pattern does not show the cuts necessary to round the stock down. That is the initial step, and consists of shaving off the corners with a series of small cuts with a gouge held perpendicular to the wood and canted 45 degrees toward the direction of movement. In the case of the bobbins, it was only necessary to round the area around which the thread would be wound.

The keys to good results with the lathe are care, patience, and advanced planning. A series of small cuts is less prone to error than a large cut. Cutting too deeply risks a "catch," where the tool digs too deeply and scars the wood. I experimented with both the shaving and scraping technique, and found that the extra care required by the shaving technique was well worth the finer finish it created. A carefully shaved surface required little or no sanding later.

The order in which cuts are done is generally from the darkest colors to the lighter colors in the diagram, i.e. black, blue, green, red, then gray.



Having explained how to read the pattern, I will now detail the actual procedure. The initial cuts are done with a skew chisel held perpendicular to the wood with no cant at all, gouging a shallow triangular cut (black). Then, using the same skew chisel, shave down one side then the other to gradually widen and deepen this initial cut (blue, green, red). Finally, shave off the corners a little at a time to round the shoulders. This consists of rolling the skew chisel over and back at the same time. The cutting edge must remain at the same attack angle to the wood at all times, while recognizing that you are cutting in a circular path that also follows a curve of diminishing diameter, so this attack angle changes throughout the depth of the cut.

I attempted to match the pattern from one bobbin to the next by carefully measuring the center of each groove, though the match from one to the next is by no means perfect. The use of calipers would have improved this, and I will eventually buy or build some calipers for this purpose. Turning the wood took about 2 hours to turn all 4 bobbins.

I finished the bobbins by planing, sanding and scraping any remaining rough spots, cutting the ends off to get rid of the lathe index marks from the centers, chiseling the ends to take off the corners, and marking them with the files. On the bottom of each bobbin is my signature rune, and on the top of each is a different number of lines, from zero to three, to help the person using them keep track of the threads. This step took about 2 hours for all four bobbins. The total time for the project was 4 1/2 hours from start to finish.

Lessons Learned

The bobbins work fairly well, but they are too light for any but the finest threads. The next set that I make will be made from a heavier wood and have a more substantial base, and I will include a button on the bottom, such as those illustrated by Hald, to tie on extra weight.

This was my first wood turning project, and there were one to two times when I failed to exercise proper care and allowed a "catch" that nearly ruined the work. Despite this, I found that I prefer shaving over scraping, because little or no sanding was needed on the turned areas of the wood.

While the power lathe is a good way to learn basic lathe techniques, I plan to develop my lathe skills to the point where I will feel comfortable building and using a pole lathe for greater authenticity and to demonstrate at events.

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