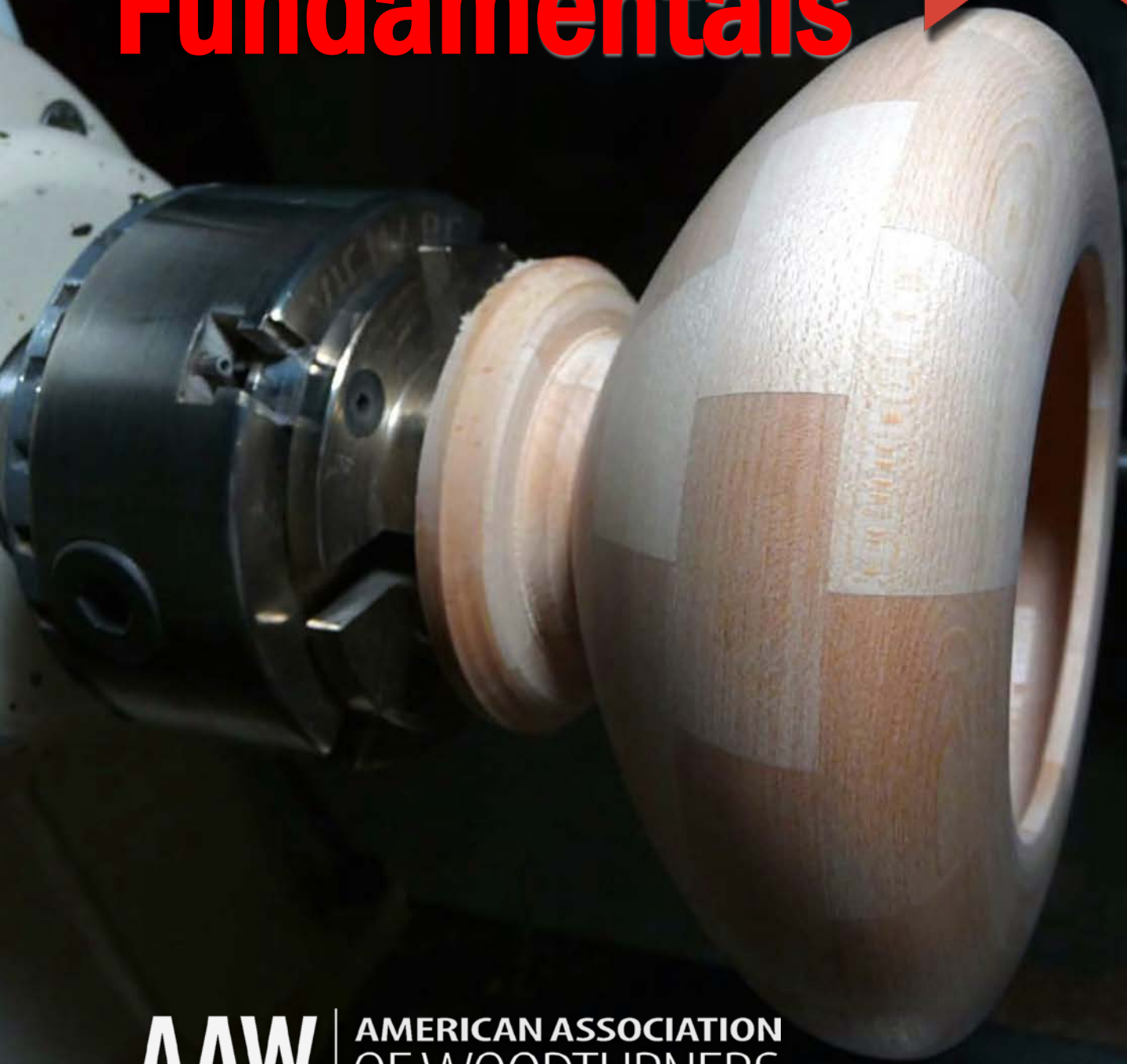


Woodturning Fundamentals

AAW
EDUCATION



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OF WOODTURNERS

woodturner.org

September 2014 | VOLUME 3: ISSUE 5 | Safety | Projects | Tips | Techniques

Woodturning Fundamentals

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of Woodturners
222 Landmark Ctr.
75 5th St W
St. Paul, MN 55102
phone 651-484-9094
website [woodturner.org](http://www.woodturner.org)
Exec. Director: Phil
McDonald
phil@woodturner.org
Program Director:
Linda Ferber
linda@woodturner.org

Board of Directors

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A Note About

Safety: An accident at the lathe can happen with blinding suddenness. Respiratory and other problems can build over years. Take precautions when you turn. Safety guidelines are published online at <http://www.woodturner.org/?page=Safety>. Following them will help you continue to enjoy woodturning.

Cover photo: Andy Chen

WELCOME

A Note from the Woodturning Fundamentals Chair

In this edition, we are happy to include the first of two articles by Andy Chen, Segmenting 101. This type of woodturning is very popular and the article will provide you with information on the planning and preparation required for successful segmenting. Segmenting requires layout for design and form prior to starting the project. Building a segmented blank can be as complex or as simple as you desire. I would recommend starting with a simple pattern. I hope you will enjoy the article and the exposure to a new, and possibly unfamiliar, type of turning.

It may seem a little early to be talking about the year-end holidays, but because we are a bimonthly publication, this is our only opportunity to ask you to share photos of your holiday ornaments for publication in *Woodturning Fundamentals* this year. So, please send your photos of your work to linda@woodturner.org no later than **October 10** so that we can publish them in our November edition of *Woodturning Fundamentals*. Along with your photo in jpg format, please include your name, the size of the work, type of materials used, and the date made. We will send a copy of *Woodturning Today, A Dramatic Evolution* to those whose ornament work we publish. The book celebrates the first 25 years of AAW history and I'm sure you'll be proud to own a copy.

Do you have a pesky woodturning problem that just won't go away? Or, are you looking for a resource for a tool, finish, or wood? Then we may be able to help. Please send a description of your problem or question to *Woodturning Fundamentals* at linda@woodturner.org. We will do our best to find a professional who can provide you with an answer. If you have a question or problem, it is very likely that many others have the same question or problem. Sharing your woodturning issues through *Woodturning Fundamentals* is a great way to help everyone!

As always, I welcome your suggestions, questions or concerns.

Sincerely,
Denis Delehanty
denis@woodturner.org

SEGMENTED TURNING

Segmenting 101

The greatest difference between segmented turning and traditional turning is the turner must decide what final form the turning will take even before the first cut is made. Although there are countless possibilities as to the form and design, once the segmented turner sets the course, there is very little leeway for deviation from the original design. So planning is the crucial part of the entire process. Typically, segmented turnings are composed of stacked rings of varying sizes.

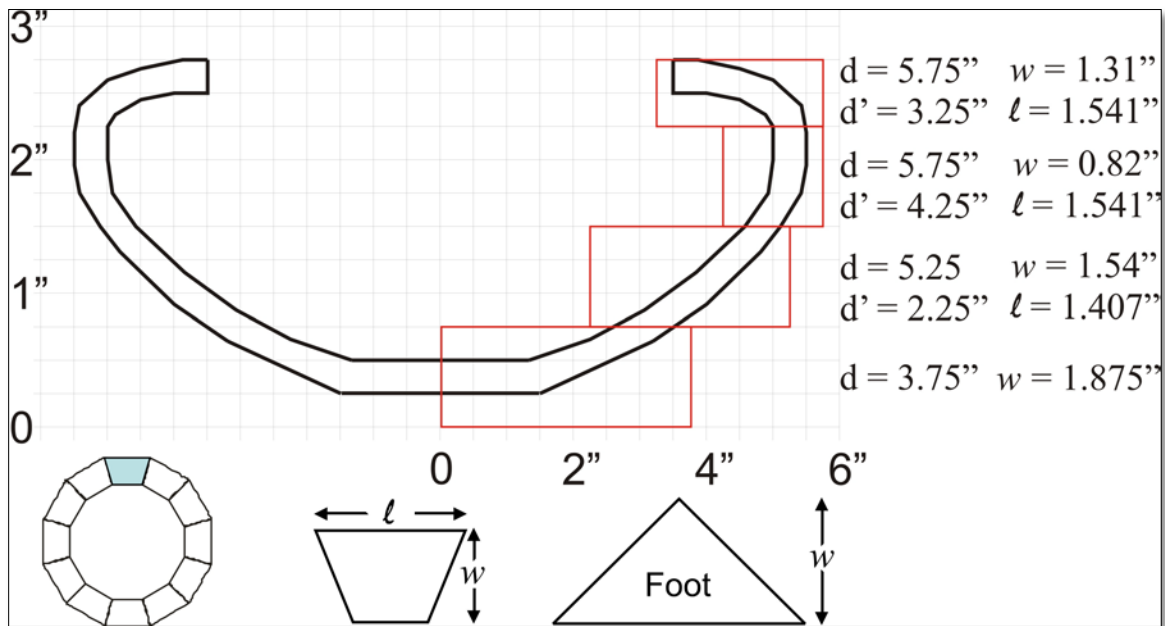


Figure 1. Design of a simple segmented bowl.

Figure 1 is a sketch of a simple bowl that is built from four segmented layers. It was designed by hand drawing on a traditional graphing paper. The dimensions of the necessary segments are then calculated accordingly.

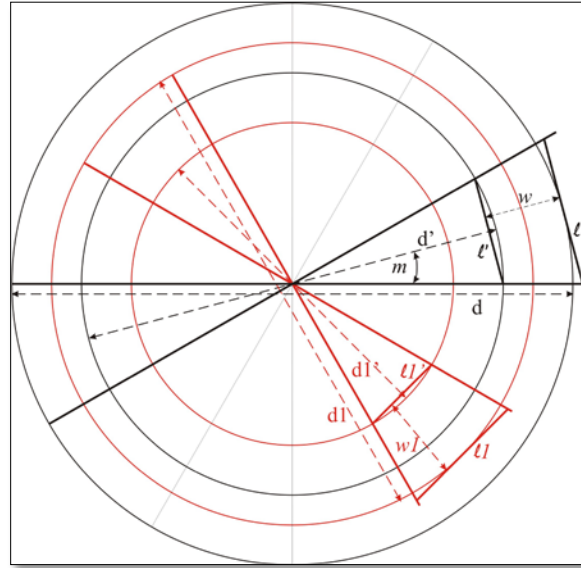


Figure 2. Calculation of segments on two overlapping rings of different diameters. The OD (d , d_1) and ID (d' , d_1') of each ring are determined from the sketch. Note that the width of the segments is NOT the difference between the OD and ID.

$$m = 360^\circ / 2n$$

$$w = 1/2(d - d' \times \cos m)$$

$$l = d \times \tan m$$

$$l' = d' \times \sin m$$

$$\text{Board length for a ring} = (l + l') \times (n/2) + (0.125'' / \cos m) \times n$$

n = Number of sides, m = miter angle, d = diameter of ring, d' = internal diameter of ring

w = width of segments, l = length of segments, l' = short length of segment (only for the calculation of the total board length), $0.125''$ = saw kerf

Non-italicized are assigned and *italicized* are calculated

Example For a ring with 12 segments, 6" OD, 4" ID

$$m = 360^\circ / (2 \times 12) = 15^\circ$$

$$w = 1/2(6'' - 4'' \times \cos 15) = 1.068''$$

$$l = 6'' \times \tan 15 = 1.608''$$

$$l' = 4'' \times \sin 15 = 1.035''$$

$$\text{Board length} = (1.608'' + 1.035'') \times (12/2) + (0.125'' / \cos 15) \times 12 = 17.307''$$

Table 1

Layer	n = # of seg	m = miter angle	d = OD	d' = ID	w = width of seg	l = length of seg	l' = short length	Total board length	T = thickness
1 (Foot)	4	45	3.75		1.88	3.750	0.000	8.21	0.75
2	12	15	5.25	2.25	1.54	1.407	0.582	13.49	0.75
3	12	15	5.75	4.25	0.82	1.541	1.100	17.40	0.75
4	12	15	5.75	3.25	1.31	1.541	0.841	15.84	0.50

The formulae for calculation are all in the caption for Figure 2 which shows two overlapping rings of different diameters. Table 1 is a spreadsheet that is an actual printout from Excel which makes the process less painful. There are computer programs on the market that make life much easier, such as Woodturners Studio (woodturnerscatalog.com), Woodturner Pro (woodturnerpro.com), for example.

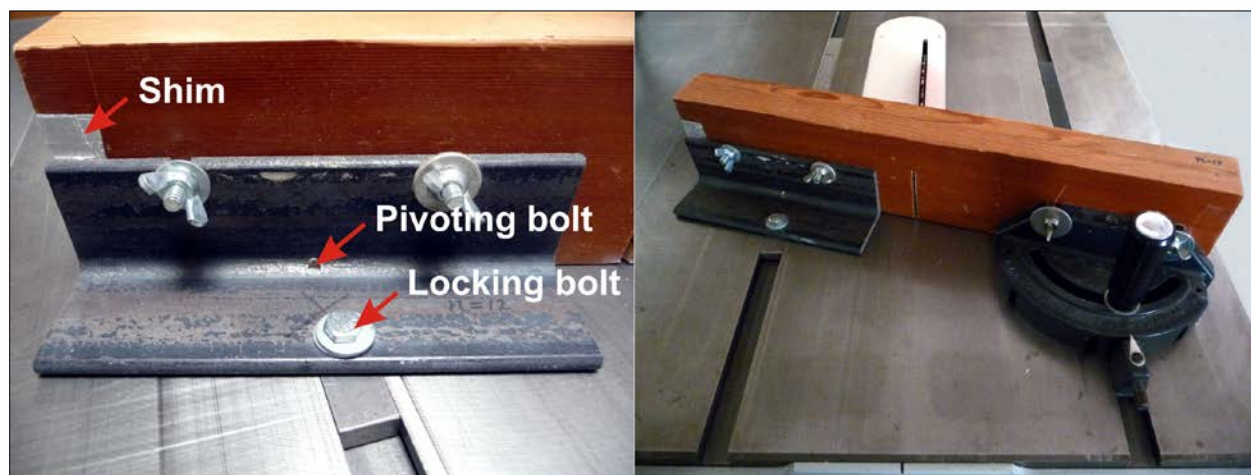


Figure 3. Miter gauges for cutting segments on a table saw.

Arguably, the most critical aspect of building a segmented turning blank is cutting the miter angle on segments accurately. I use homemade miter gauges that are dedicated to a certain angle for this purpose (Figure 3). The miter gauges are constructed of 2" x 2" x 1/4" angle iron and 3/8" x 3/4" steel bar for the guide bar. A preliminary angle is set by reference to a store-bought miter gauge and both the pivoting and the locking bolts are tightened. The final adjustment is made by making trial cuts and shimming the sacrificial fence until a perfect angle is achieved. A second adjustable miter gauge is also attached to the fence to eliminate any side play.

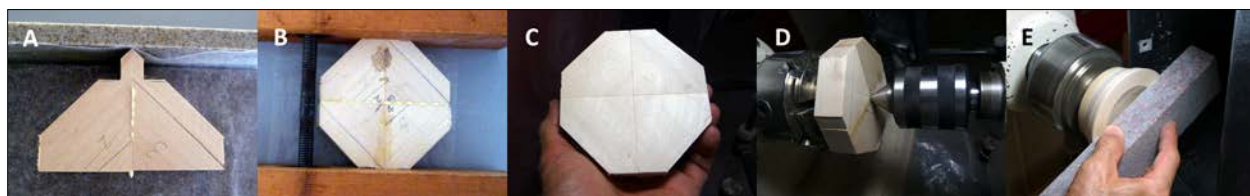


Figure 4. Making the foot (first layer). A: Gluing two quadrants together; B: Gluing two halves together after the facing surfaces are trued up; C: One side sanded flat on a disc sander; D: Tailstock used for centering/holding onto the waste block after glue is applied; E: Truing up the first layer. Note the center has been dished out for easy truing.

Procedure

The foot (bottom layer) is constructed with four equal segments cut diagonally to the wood grain. They are glued in two pairs. The facing sides of the two halves are trimmed on a table saw and the two halves are glued together such that the apexes of all four segments come to the center (Figure 4). One face of the block is flattened on a disk sander and glued to a waste block already trued up on the lathe. A center mounted on the tailstock is used to center the piece on the waste block, as well as to provide pressure while the glue sets. The block is turned round and the center of the block is dished out to nearly final depth before the edges are trued up to a perfectly flat surface.

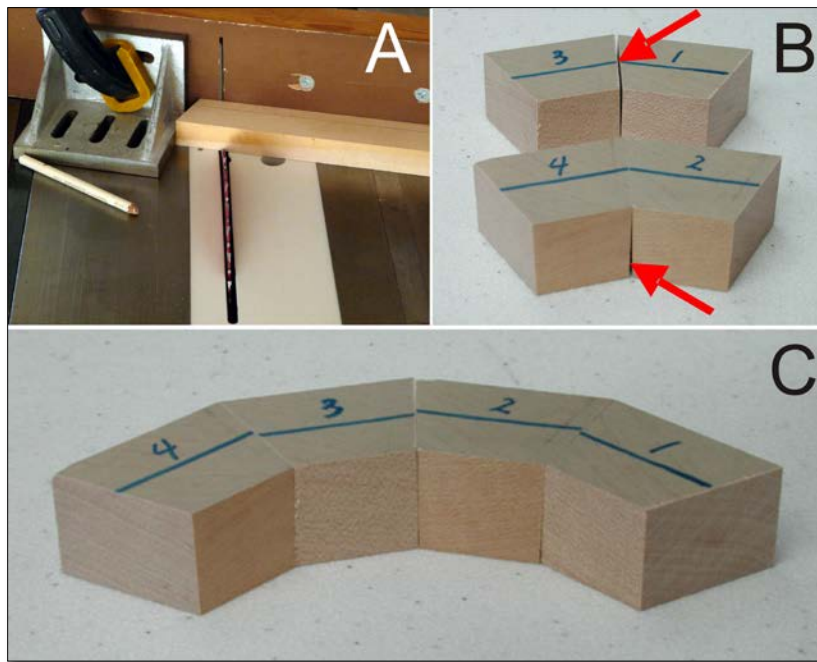


Figure 5. Cutting segments for subsequent layers. A: A stop is clamped to the sacrificial fence for repeatable length; B: Gaps resulted from a combination of imperfect adjustment of the saw blade and not putting segments together in the correct sequence; C: The minor imperfection is canceled out when segments are assembled in the correct sequence.

The other layers are built from segments cut using the miter gauge assembly described above using a stop block. Flip the strip of wood after each cut to produce trapezoids of identical size. Make sure the stop block is on the "open" side of the saw blade so that the cut off segments would not be caught between the stop and the blade (Figure 5A). Also note an old-fashioned pencil eraser is used to hold the segment down as you back the board out of the blade. It is important to mark one side of the wood strip with a pencil along the length of the piece before cutting. Flip over every other segment IN THE SEQUENCE they come off the saw so that the pencil-marked side faces up. This way, if the saw blade is not perfectly perpendicular to the table, the inaccuracy will be canceled out between segments (Figure 5).

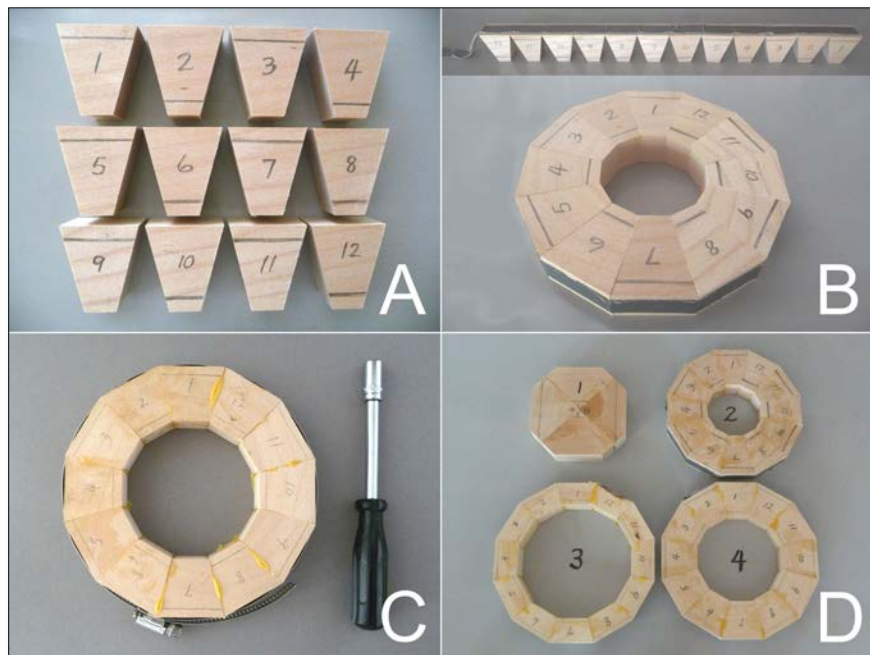


Figure 6. Gluing segments into rings. A: Twelve segments ready for assembly; B: Segments are wrapped around with a strip of duct tape to check for fit; C: A clamp is used to hold the ring together after glue is applied; D: All layers are glued together.

To check for a perfect fit, wrap the segments tightly together with a strip of duct tape to form a ring. If you do not see light between segments when holding the ring up against light, unwrap and apply wood glue between segments with the tape attached. After rewrapping the tape, snug up the ring with a hose clamp as shown in Figure 6. The duct tape ensures that all outside corners of segments are properly aligned and keeps them aligned while the glue is applied.

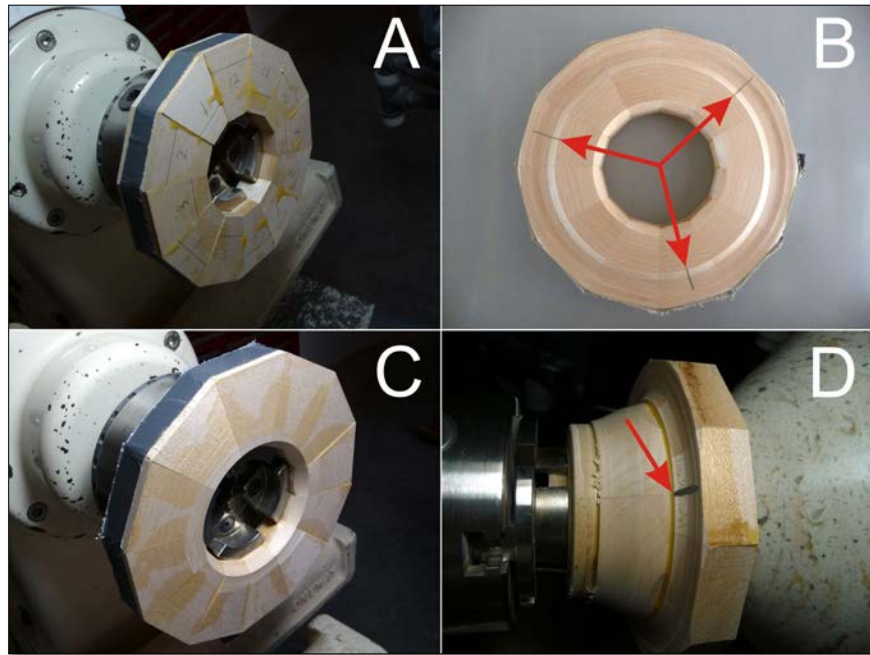


Figure 7. Truing up one side of the ring. A: Ring mounted for truing up one side (with chuck in expansion mode); B: One side of ring trued up and middle of segments marked; C: Center of second side rounded for perfect alignment; D: Second layer glued onto foot, pencil mark/seam lined up.

After the glue sets, true up one side of the ring and mark the middle of a couple of segments (Figure 7B) for easy alignment with the previous layer. (I true up the ring on the lathe. Notice in Figure 7B the outside of the ring has been turned away so you only need to true up the area that will be glued to the previous layer.) Use a cone that can be mounted on the tailstock for concentric alignment of rings as well as to provide pressure as shown in Figure 7D.

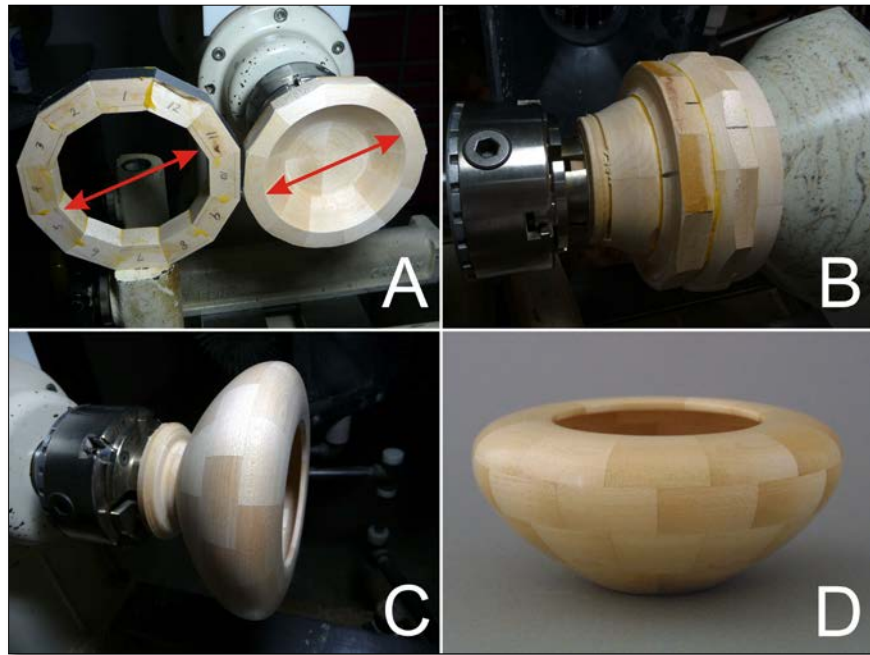


Figure 8. Assembling all rings and finish turning. A: Cut away the inside of the smaller ring - easier to true up; B: Glue all rings together concentrically using the centering cone; C: Finish-turn the outside and inside; D: Completed bowl.

True up the face and one side of the next ring and glue the new layer to the previous layer, again using the cone to center and provide pressure. Repeat the process until all the layers are glued together (Figure 8). Finish-turn the bowl after the glue is set. Sand to 320 grit on the lathe and apply your favorite finish.

~ Andy Chen
College Station, Texas

Notes:

- Anyone interested in the segment calculation spreadsheet is welcome to e-mail Andy (acc1@andyscustomcraft.com) free of charge.
- Also, the next issue of *Woodturning Fundamentals* will include Andy Chen's follow-up article, Segmenting 201.

SAFETY WHILE TURNING

You can have your cake and eat it too!

I always feel guilty when I go see the dentist. We all know the rules—avoid sweets, brush after every meal, floss several times a day.¹ Talking about tool and shop safety gets the same treatment in articles and books—always read the owner's manual, inspect your tool for hazards daily, make sure your tools are properly grounded. Sound familiar?

The challenge I present to you is that it is possible to be safe and have fun in the shop as well. Some common sense, some discipline, some planning, some behavioral changes and listening to that little voice in the back of our mind can make shop time more productive, fun, and safe.

In 2013, the average cost of a hospital emergency room visit was \$1,233. Do you need more incentive?



¹ You can thank Levy Spear Parmly, a dentist in New Orleans, who invented dental floss in 1815.

Personal Safety

Personal safety falls into a variety of discussion areas:

- State of Mind
- Physical Conditions & Impairments
- Clothing & Personal Items
- Hair
- Face Shields
- Hearing Protection
- Dust Control

State of mind is an overlooked aspect of safety. If I am in a hurry, foul mood, or distracted, not only will I not do my best work, I am putting myself at risk. If you are feeling any of these distractive thoughts creeping in, shut off the lathe and take a break. A wood lathe spinning at 2400 rpm makes 40 revolutions per second, so things happen fast!

Physical conditions and impairment(s) are a factor we must contend with, particularly as we age.² Know if any medication you are taking impacts your lathe work. If so, talk to your physician and pharmacist to see if there are alternatives or better ways to manage a prescription drug's reaction to your turning time. Recreational drugs and alcohol consumption are to be avoided while you're turning. Have a drink afterwards to celebrate your

² Juan Ponce de Leon died, never finding the fountain of youth.

time in the shop, not during a turning session. If you are having trouble gripping your turning tools, look at other handle shapes or ways to lessen the pain or awkwardness associated with holding the tool.

Wear appropriate clothing in the shop. Short sleeves and proper shoes are a must (no, turning in sandals is not safe). Use a turner's smock. A turner's smock not only keeps wood shavings from getting into every nook and cranny of your clothes, but is also a smooth surface that acts as a form of protection. Remove jewelry and tie up long hair. Be smart about what can wrap around a spinning lathe or what can happen if a tool falls on your foot. Think about what you are standing on while you turn. A concrete floor is very unforgiving to the human body and wood turning tools. Consider a gel or rubber shop mat to decrease leg pain and make a more comfortable turning environment. Choose appropriate and safe footwear.

Eye protection is a must and goes beyond what is needed for many other forms of power equipment work. Do not rely on prescription glasses or even shop glasses to protect you. They are designed for different dangers. A full face shield or face shield with a built-in respirator is a must. Note that all face shields are not created equal. Find one (with ANSI Z87+ rating) that fits well so that you wear it and it protects you from the force of flying wood.

Consider using hearing protection while you turn. Lathes are not loud, in and of themselves. However, adding a dust

collector and a sander to the mix can increase the total decibel levels to a harmful level. Remember: hearing is not repairable if lost!

Dust is a constant difficulty in the woodturner's hobby. Educate yourself about dust collection at the source and ambient dust collection in the shop. Almost every wood (or possibly all of them, it's not my expertise) are irritants to the human lungs. Note that some woods are more than mere irritants and may in fact be a health threat to you. For a chart of wood toxicity go to: <http://www.wood-database.com/wood-articles/wood-allergies-and-toxicity/>

Your Shop & Work Area

Talking about shop³ cleanliness, efficiency and safety is the equivalent to stepping into a debate on who is the better team between bitter football rivals. However, I will make the journey and ask you to keep an open mind as we go on it together.

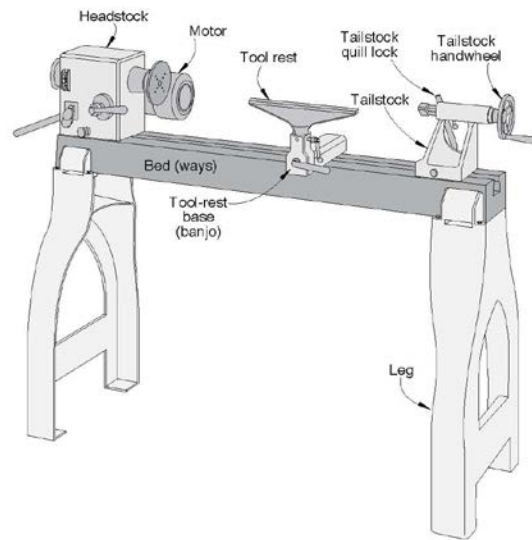
View your shop not through your eyes, but through those of an insurance adjuster or safety inspector. Yes, I know that cord wrapped with electrical tape has been there for 10 years, but is it safe? Ditto the missing outlet cover half full of sawdust. All of our little "compromises" in our shop are part of the journey, but isn't it time to sort them out, do it right and make your shop safer?

³ I use the term "shop" loosely in this context. My grandfather's shop was a 3' counter next to the dryer. On non-wash days, he was allowed to use the dryer top too if he put an old towel down.



Some shop areas to put on the safety review checklist include:

- Fire extinguishers and smoke detectors;
- Appropriately sized and stocked first aid kit;
- General shop layout and clutter;
- Flammables and toxic chemical storage;
- Wiring:
 - Appropriate amperage and wire size,
 - Circuit panel or on-off switch,
 - Switch covers and outlet plugs,
 - Code violations,
 - GFI protectors,
 - Separate lighting circuit(s);
- Extension cords and trip hazards.



The Lathe

The lathe is a wonderful tool and, at first blush, is far safer than other woodworking tools!⁴ Used properly, it gives great joy and an acceptable to modest level of risk. Sometimes I think that due to the low risk and inherent safety, turners think that nothing can go wrong. Do not accidentally fall into that trap.

Keep your lathe bed clean and do not let junk accumulate on the headstock or the lathe bed. The lathe bed is not a tool storage tray. Never use it as one. Lathe tools are indiscriminate and cut people and wood equally well.

Keep nicks out of the tool rest and lubricate it and always set it at the correct height and distance from the work. Give the work a spin to make sure you have clearance and that everything is tight.

⁴ That is why I am not a chain saw carver. There is no such thing as a “minor” chain saw accident.

I grab the banjo and give it a shake to make sure everything is tight before I turn on the lathe.

The tool rest is a safety feature of your lathe; always use it to its full potential. It acts as a finger rest, stop, and a reminder of where you are and are not safe to put your hand (think natural edge bowl). Reposition it often, always set it to the correct height (and stop to change it often). Do not fall victim to the, “I only need one more cut” syndrome. Stop the lathe, reposition the tool rest and do it right. Yes, I said stop the lathe! Do not reposition the tool rest on a lathe under power.⁵

Whenever I turn off the lathe at the end of a turning session, I turn off the master on-off switch and turn the variable speed all the way down. That way whenever I approach the lathe, I know what to expect. If I change belt speed, I set it back to my normal setting so there are never any surprises.⁶

⁵ I do admit that I do sometimes hit the off switch, loosen the banjo or tool rest and reposition it before the lathe stops turning (at least on my lathe that does not have dynamic braking, I am not Superman). My justification is that if I hit the piece, there is only centrifugal force behind it under the flywheel effect, but no more force is coming from the lathe itself).

⁶ Surprises are great at birthdays and Christmas, but not when the lathe is in the high-speed-belt setting and a 10-inch out-of-balance bowl is sent flying across the room!

I never turn on the lathe unless I am wearing my face shield (it hangs on the on/off switch housing). Create safe habits so that you do not have to think about it. After you have done this, the safety procedures do not seem to be an extra step, just part of turning your work.

The tailstock is your friend. Use it whenever you can. Even pieces in a chuck are safer with a tailstock in place.⁷ I keep it engaged as long as possible. Vibration is reduced and it creates two points of contact with the wood. It has saved not only a piece of wood or two, but I have been kept safe more than once from a situation by using a tailstock.⁸

⁷ I'll let you in on a secret, wood sometimes exits the chuck. I have had spigots snap off sound wood, internal recesses crack out, and mysterious incidents where a bowl suddenly went airborne from a high-quality chuck that had a spigot contacting the wood correctly.

Yes, there are correct and incorrect ways for wood to make contact in a chuck. Read your instructions. Generally, the wood must not bottom out in the chuck so that the spigot of the work touches the lathe body or the chuck jaw bottom. The spigot must contact the jaws correctly and cover most of the jaw surface, and, most importantly, the work must contact the top of the jaws at a full contact area.

⁸ As we advance in our woodturning journey, we seem to turn more complex forms, thinner walls, more air in wood with voids or wings, and wood with less structural integrity. All of these situations make safety more important, not less, as we progress as turners.

Wood and its Dangers



Wood varies not only by species, but by tree, and even where on the tree the wood was harvested. For example, lower trunk wood on a tree that grew on straight, level ground will exhibit different turning characteristics than branch wood. Add variables such as growing on a slope near water, or being subject to insects or other stress factors, and you may find that a single tree exhibits multiple personalities while being turned. Further adding to the mix is whether the wood is wet or dry when turned, how it was dried, and if anything influenced the wood during the process of drying (e.g. spalting).

I like turning figured wood and odd growths on a tree (burls, branches, tree crotches, roots) and need to remind myself of the wood's inherent surprises (both positive and negative). Project failures, bark inclusions, rocks (yes, I said rocks), bullets, barbed wire, nails, fence staples, and many more little wonders may await you in a piece of wood! As my grandmother said multiple times,⁹ "Mark, if you are in for a penny, you are in for a pound."

Understand that you must take extra safety precautions because the centrifugal force of turning may cause your work to explode, crack, and fly around the room. Use your tailstock whenever possible, watch your lathe speed, and stay out of the line of fire. Things happen fast to woodturners.

Above, I talked about wood toxicity. It is not a joke. I know a woodworker who developed asthma (permanently, I may add) from working with rosewood. If your skin tingles, your eyes water, or you start coughing or sneezing, stop and consider whether you should continue with the turning and what additional precautions you need to undertake. I have a piece of wood that has sat in my shop for four years to remind me that that piece of wood and my body are not friends.

~ Mark Palma
Chippewa Valley Woodturners Guild
Cameron, Wisconsin

⁹ I was a discipline problem and spent a lot of time with Grandma Bowman, including one complete summer, but alas, I digress.

TEA LIGHT

Adding Texture to Your Turnings

As a high school Technology and Engineering teacher, I am always searching for practical projects for students. Students really like using the wood lathe for projects. They seem captivated by the spinning workpiece, using tools to cut shapes, making chips fly, and the instant gratification many wood lathe projects can provide. I needed an additional project to teach objectives related to pneumatics. After I planned for projects using various pneumatic tools I had access to, I still had one tool, a needle scaler, which needed a practical application. I had made many tea lights with students, so I began using a needle scaler to add texture. The following is a procedure for creating a tea light with texture. I coined the term, “smumpy,” to describe the texture. Smumpy is a combination of the words smooth and bumpy.



I drilled a 7/8" hole in the center of the tea light blank to center and hold the spur. I suggest not drilling more than 1/4" deep. If you use a spade bit to drill the hole for the tea light, this works well. If you plan to use a Forstner bit to drill for the tea light, omit this step.

Mount the blank between centers.

Shape the bottom half first. The final shape will be donut-shaped. Remember to make the

bottom slightly concave to create a foot. Since the blank is being turned in face grain orientation, use a bowl gouge or scraper. Do not use a spindle roughing gouge.

Since the blank is being turned in face grain orientation, use a bowl gouge or scraper. Do not use a spindle roughing gouge.



Shape the top half of the tea light next. Draw a line to represent the diameter of the tea light insert (candle), in this case, 1 ½". Be sure to measure the tea light insert (candle) you will be using. There are many tea lights inserts (candles) available and the diameters vary. This will influence the size drill to be used or if you decide to turn the recessed area instead of drilling.

Finish shaping the top half. I shaped the top with a small concave surface, stopping just past the 1 ½" diameter mark from the previous photo. Now is a good time to do all necessary sanding. Sanding with 100 and 150 grit sandpaper is acceptable since the tea light will be textured later.

Carefully remove material from the bottom to create the shape of the foot. Make the diameter in the center as small as you feel comfortable with.

I modified a hand screw clamp by cutting out an arc on each side and gluing cork to help cushion the clamping force. Use a sharp chisel to remove the raised center portion. Be careful not to gouge into the tea light. When finished removing the raised center, the outside foot must be able to rest flat on a table without interference of the material in the center. You do not need to chisel the center perfectly flat. This will be fixed later.



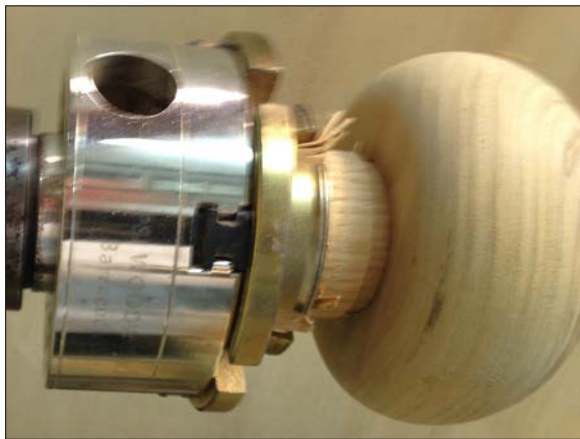
Use the modified hand screw clamp to hold the tea light when drilling. The clamp and tea light must both rest flat on a table before drilling. Mount a spade bit in a drill press and before drilling, be sure the center of the spade bit will contact the center of the tea light without touching the outside edges. Take time to measure the thickness of the tea light (candle) and calculate to correct depth to drill. Set a depth stop on the drill press. Trying to re-drill the hole deeper can be dangerous. Make a jam chuck by mounting a piece of wood larger than the diameter of the hole drilled in the tea light. Turn the diameter to match the size of the drilled hole. The jam chuck should extend to the bottom of the drilled hole in the tea light. Mount the tea light on the jam chuck.

Take time to measure the thickness of the tea light (candle) and calculate the correct depth to drill.





Sand the bottom smooth.



Check to be sure the tea light mounted on the jam chuck spins true. If it does not, make necessary adjustments. Using very light cuts, carefully use a scraper or bowl gouge to remove the raised center portion. The bottom surface should be slightly concave.





Prepare the needles for use to texture your tea light. The metal rods called needles will need to be modified. Following manufacturer's guidelines, take apart the needle scaler to remove the needles. Use a disc sander to gently round the ends of the needles. Reassemble the needle scaler.



Gently, hand sand with 320 sandpaper and finish. The tea light on the left is finished with gloss lacquer. The tea light on the right is finished with teak oil. Try to be creative--add some color, a raised ring and/or other design elements.



Carefully, hold the tea light in one hand and the needle scaler in your other hand. Using light to moderate pressure, move the needle scaler to create a textured surface all over the tea light.

~ Scott Schlosser
Huntly, VA
huntlybears@comcast.net

Safety First: These tea lights are made to contain a candle. Be careful with fire. Never leave a burning candle unattended.

GRINDER STAND

Stand with Storage

I've had my grinder on a portable workbench located just a few steps from my lathe. The bench was taking up too much valuable real estate in my shop and was not terribly sturdy. Although there are a number of fairly inexpensive grinder stands available, I wanted my stand to include some storage, so I built my own.



For the base, I made a 16"x16" box out of 2x6's. I put a 3/4" plywood bottom on the box. Next, I filled it with about 40lb of Quikrete. The stand column is about 8.5"x8.5"x27." I'm vertically challenged, so most woodturners would have their stand somewhat taller than mine. To allow for storage, I cut 1/4" dados 2 1/2" apart on the inside of the sides. To have the slots line up, I cut the dados into a piece of plywood twice the width of the sides. Then, I cut the sides apart. I cut rabbets into the back, then glued and screwed the stand together.

I screwed a 3/4" plywood top to the base and then made cleats to fasten the stand to the base. The column top is another piece of 3/4" plywood screwed into the stand. Before attaching it, I rounded the corners and rounded over the top edge.



The drawers are made from 1/2" plywood. The drawer bottoms are made from 1/4" plywood. The drawer bottoms should be wide enough to go into the dado slots, but not so wide that they bind. To keep chips out of the drawers, I added a door to the stand. I applied a couple of coats of polyurethane. Since my grinder is bolted to another piece of plywood with the jigs attached, I just put the grinder/plywood on top of the plywood that is screwed onto the stand and clamp it in place. This allows me to take the grinder out of the shop, if the need arises.




Finally I added a “shower” curtain. My grinder is in the line of fire when I’m turning wet wood. The shower curtain is simply a piece of clear shower curtain sandwiched between two pieces of wood and fastened to the wheel guards on the grinder. Bamboo skewers on the top edge of the curtain keep the ends of the curtain from dipping down and possibly contacting the wheels. The curtain can be rolled up or simply draped over the back of the grinder when it’s not needed.

I bought a sheet of ¾” plywood at Shurway Lumber in Vancouver. They usually have a stack of seconds for about \$25/sheet. This is actually less expensive than their regular plywood. What I bought is finished on two sides. One side is birch and the other is red oak.

~ Kathleen Duncan
Ridgefield, WA
Cascade Woodturners

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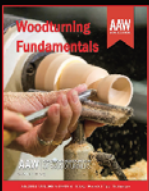
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TAGUA NUT PROJECT

Demonstration by Dick Veitch

The tagua nut palm is a native of South America (e.g. grown extensively in Ecuador), also grown in the Philippines, Solomon Islands, and Guam. Guam has a disease in the plants and any importations from that country have to be heat-treated, which changes the color from white to a creamy color. The nut is known as “vegetable ivory” due to its color and consistency.

The nut is hard, but has a cavity in the center. In the countries noted above, the nut is used for button-making and carving for sale to tourists. The tagua nut palm produces nuts in a bunch called a cabeza. The cabeza may take 3 to 8 years to fully mature and drop off the palm.

What can we use the nuts for? They can be used for lidded boxes, salt and pepper shakers, small vases. In this instance, Dick Veitch chose to make a vase.



Step 1

As near as possible, center the nut between two small step centers, and turn to round, taking all of the outer brown shell off the nut. Run the lathe at about 1800 and use a skew chisel. The nut cuts quite easily. Consider the shape you want and turn a spigot at each end, about a 12mm x 1mm spigot on the foot end, getting rid of the shell. The second chuck bit on the top is turned so that it can be used to clean up the foot.

Step 2

Use pin jaws to hold the top, bring up the tailstock to ensure center and clean the foot using a small bowl gouge. Take care and be gentle so that you don't have the vase flying off your lathe. Turn a small concave in the foot as you would for a larger piece. Shape down to the foot using a skew. Finish off the shape with a scraper, then 400 to 1200 grit paper.

**Step 3**

Re-chuck, holding the vase by the foot this time and complete the shape. Remember the thirds rule when shaping and shape until it is pleasing to the eye. In this instance, Dick chose to have a natural edge top. Finish off with the scraper, gently, of course, and then the 400 to 1200 sand paper so that it will be as smooth as possible.

Step 4

Reduce the speed to about 500 rpm and drill a hole to the required depth. For the demonstration piece, it was a 10mm hole leaving about 2mm thick walls. Remember that there will be a hollow patch somewhere in the nut so insert the drill slowly so that it will stay on center.



Using a special chisel called a “concrete nail,” shape the inside of the top of the neck, then using a very special chisel called “bent concrete nail,” gently hollow the inside of the vase.

Finishing: Wax can be used that can be done off the lathe.



~ Earl Culham
South Auckland Woodturners Guild
Photographs by Ross Johnstone

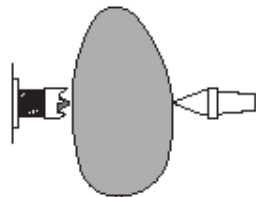
TAGUA NUT BOX

Box Diagrams

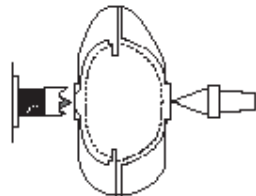


TAGUA NUT BOX

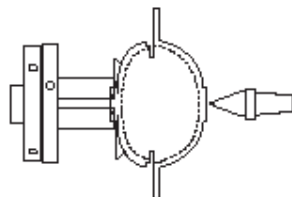
This project is shown using Teknatool pin jaws for the small chuck bite (12mm is ideal but up to 25mm) and Vermec 35mm jaws for the larger chuck bite (35mm is ideal but up to 45mm). It is important that you plan and cut carefully to suit the chucks or other holding methods that you wish to use.



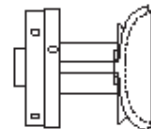
Choose a small drive spur and place the nut between centres. The narrowest dimension of the nut should be between the centres and thus the broad flatter faces of the nut towards the head and tail. Try to get it central laterally.



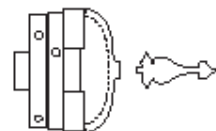
Cut a spigot at both the drive spur and tail. The spigot at the tail will be the foot of the finished box so be sure to get the size right.



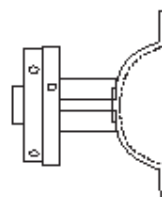
Mount the nut in a chuck holding the spigot on the planned lid of the box. Cut the upper face of the bottom part of the box first and continue this cut in so that it is the start of parting off the lid. Start the shape of the lid and then cut a small spigot to suit your 30mm chuck (or your chosen holding method). Shape the underside of the box ensuring that the curve of it matches the curve of the lid. Sand and finish the underside. Part the bottom off.



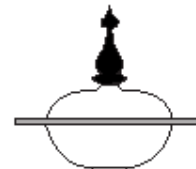
Set the bottom aside. Hollow the top. Sand and finish inside the lid and the outer curve that is already cut to shape.



Remount the box lid in your 30mm chuck (or your chosen holding method). Turn the outside of the lid. In another chuck make a finial and fit it to this lid.



Put the box bottom back in the chuck. Hollow it. Make sure that the width of the edge of the hollow is a nice fit for the lid. Sand and finish.



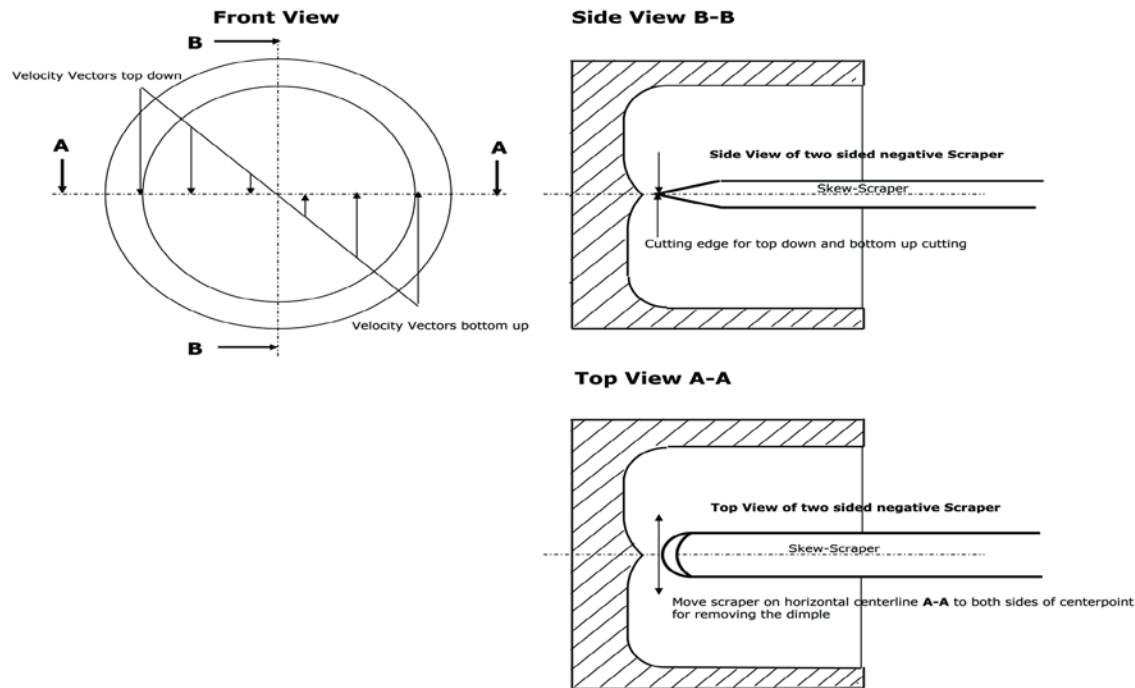
This project sheet was printed from www.sawg.org.nz

SHOP TIPS

Removing Dimples

I think most of us novice turners have problems with dimples at the center of the inside bottom of boxes and other turnings. Here is a simple tool and process that will help to eliminate dimples.

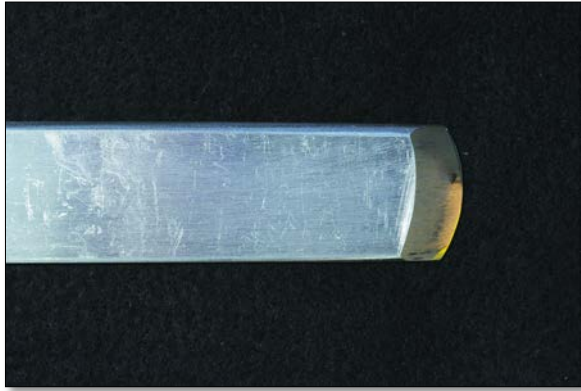
Remove Dimple in Bottom of Boxes



The drawing above illustrates the dynamic of a rotating piece as well as the cutting tool in relation to a dimple on the inside of a bowl. Most cutting tools, such as scrapers, only cut top down. As soon as the tool crosses the center point, the cutting edge of the tool is no longer engaged, making it difficult to get a clean cut at the center.

The solution is to make a tool that can cut the wood in both directions, from the top down and from the bottom up. The tool is simply moved to the left and right of the center point of the box or bowl, eliminating a dimple.

Grind the cutting edge of a skew chisel to a round profile like a round-nose scraper. I reground a 1" (2.5 cm-) wide skew and put a 2" (5 cm) radius on the cutting edge.



In order to keep the cutting edge in the center, I made a toolrest that supports the skew/scrapper. The toolrest is made from wood (although it would be better in steel). This way, the tool is always exactly on the centerline of the workpiece.

I use this tool only for finishing, not for roughing out the interior of a box. Take very light cuts, and you will be surprised how easy it is to eliminate the dimple.

~Werner Witek
Appleton, WI



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FORM VERSUS FUNCTION

Start with a Good Form

You don't need to be a master woodturner to produce desirable pieces. My experience as an amateur turner has taught me that if the form is right, even a beginner can produce beautiful turnings. That's not to say anything against expert skill, but I just want to let amateurs know that form can be more important than skill.

Philosophers say that art is something that stimulates an individual's thoughts, emotions, beliefs, or ideas through the senses. It is the expression or application of human creative skill and imagination, typically in a visual form, producing works to be appreciated primarily for their beauty or emotional power. To do that doesn't require an \$8,000 lathe or three decades of turning experience.

On a trip to the Louvre, I saw a copyist reproducing one of Raphael's famous works. Impressed with the almost perfect likeness, I bought the copy and hung it over the fireplace where it can be admired every day. The same copyist created many personal paintings, but not one came close to the work of Raphael. He possessed the technical skill, but couldn't

create a beautiful original form. I stumbled across pictures of ancient Greek pottery forms of 400 to 600 BC. The forms were imaginative and perfectly proportioned. I couldn't originate such beautiful forms, but thought I might be able to turn one. The result is a number of wine pourers and chalices that I've turned which have been popular. They are not a result of great skill but the right form. Below are drawings of ancient Greek pottery followed by my turned copy below, to the right.

Copy a form that has been done well, whether from the ancient world of art or recent. If copying a form similar to the work of a current turner, give credit and attribution to the originator.

Apply the best skill you have and take care in your work. Who knows, it may wind up in a museum. If not, it can hold a place of honor in your own house.

~ Dick Webber

Central Oklahoma Woodturner's Association
Edmond, Oklahoma



Greek Oinochoe wine pourer
turned from elm.

SHOP TIPS

Accurate Drilling Depth

Some turning projects involve drilling stop holes (non-through holes) on a drill press. Some turners put masking tape on the drill bit to indicate the depth of drilling. If you have several objects of different depths to drill, you need a better solution than masking tape. I learned this trick from a machinist.

- 1) Attach a steel ruler with a 3/8" (10 mm) diameter magnet to the drill press face vertically next to the depth gauge.
- 2) Lower the handle until the bit is flush with the surface of the stock.



- 3) Adjust the height position of the ruler to align its zero mark (end of the ruler) with the depth-gauge pointer. This will align both the bit depth and the ruler to zero.



- 4) Raise the handle and lower it to start drilling until the pointer points to the desired depth.



~ Charles Mak
Alberta, Canada

SHOP TIPS

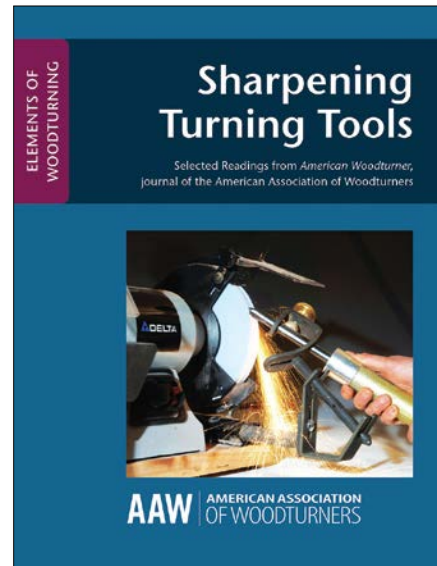
Over-the-Lathe-Bed Table

I have found that using an over-the-bed hospital tray table makes a convenient platform for tools and accessories while woodturning. It's easy to move out of the way when the tools are not being used. The height of these tables is adjustable.

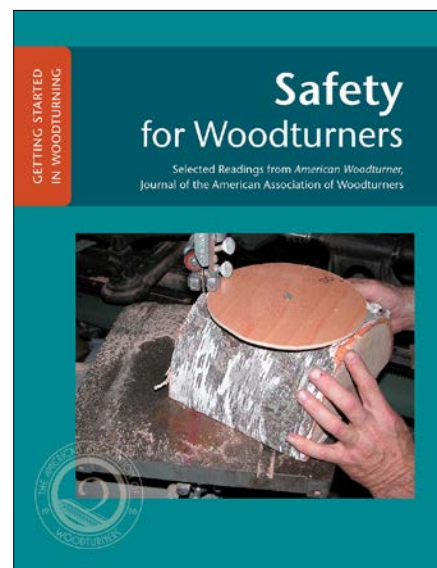


~ Vic Goetz
Punta Gorda, Florida

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WOODTURNING FUN VIDEO

FUN with Food Video



This video clip is from Kip Christensen, part of the well-known Rex and Kip team that have produced a series of woodturning DVD's. Kip shows a lighter side while he turns curly fries with an Idaho potato. Watch the chips fly – or is that fry? (TRT 3:39)

Video link: <http://vimeo.com/100209142> (Tip: If you have trouble accessing the video directly from this document, you may copy the video link and paste it directly into your browser.)

A Note About Safety

An accident at the lathe can happen with blinding suddenness. Respiratory and other problems can build over years. Take the appropriate precautions when you turn. Among the most important of these is the use of face shields, safety glasses, and dust masks. It is important to observe all manufacturers' safety guidelines. Following manufacturer's safety guidelines and information will help you continue to enjoy woodturning years into the future.

MEMBER GALLERY

Tennessee Area Woodturners



Jimmy Greenwood
Red oak burl 10" x 8"



Mike Zinser
Poplar, carved, embellished & dyed



Ross Randgaard
Natural-edge walnut bowl



Jeff Brockett
Cherry bowl, textured & burned



Brian Clarry
Ornamental turning
Blackwood & eucalyptus



Myra Orton
Gleaming crystal brooch
“Under the Harvest Moon”



Stephen Campbell
Natural-edge
Bradford pear



John Whitenack
Bradford pear
Textured, painted, dyed



Brevard Haynes
Walnut, carved



John Lucas
Plywood mirror box



Barry Werner
Turned from walnut
17" x 13" x 2.5"
Carved, burned, liming wax
Inspired by Christophe Nancey

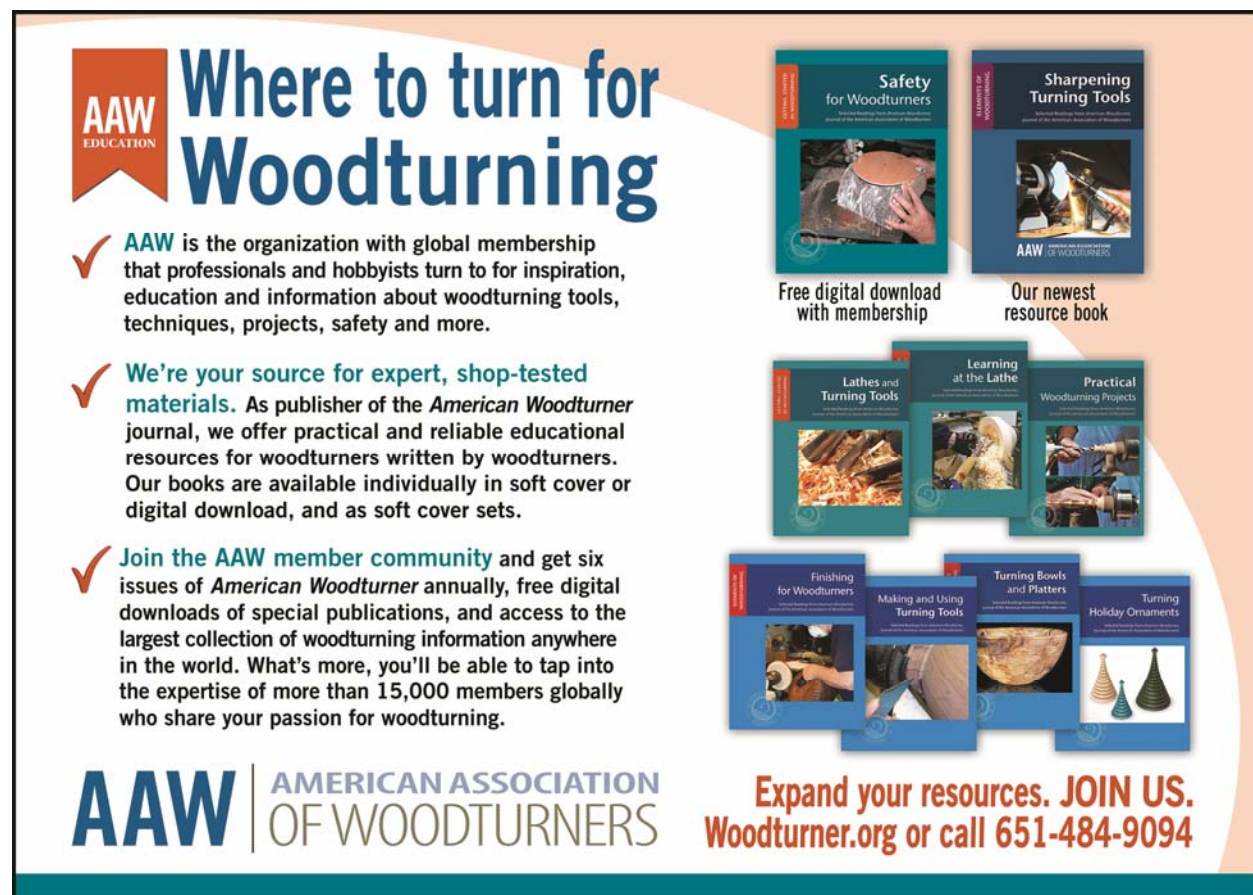
Submissions

Want to share your work in *Woodturning Fundamentals*? Please send your high-resolution images along with title, size and materials used to linda@woodturner.org.

Want to “pay it forward”? Woodturning Fundamentals welcomes other content including tips, projects and informational articles. Please send your content ideas to linda@woodturner.org. The deadline for submissions for the November issue of *Woodturning Fundamentals* is October 10, 2014.

Please note: All content submitted may be subject to edit.

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- Practical Woodturning Projects
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- Making and Using Turning Tools
- Turning Bowls and Platters
- Turning Holiday Ornaments