Self Powered Sander
For The
Wood Lathe

1/8/24

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Sanding on the wood lathe can present several problems to be overcome. In my experience the problems are as follow:

- Wood surface needs too much sanding
  - This one is on you! You need to improve your technique (more on that below.)
- Fingers get hot!
  - When holding sandpaper with your hand the friction between the wood and the sandpaper will quickly heat up your fingers to the point where you just got to quit sanding. There are several reasons why this can happen; pressing too hard, RPM is too high, worn out sandpaper and or the finish from the tool was not very good and you are trying to sand away too many mistakes.
- Power sanding dig in.
  - Using a drill or angle drill on the work with a sanding pad can result in some pretty bad results if you let the edge of the sander dig into the work.
- The work has gaps and when going over the gaps it hurts your fingers!
  - You have to be careful or quit sanding with your hand. It is known fact that if you stick your finger in a hole that is moving real fast bad things will happen!

What is one to do if you don't want hot fingers or dig ins on you work? Ok, the first thing that you should try to do is turn so that you don't need to sand! I know, that is what you have been trying to do all along. But have you? Are you actually trying to get better or are you doing the same old thing and hoping for different results? You have to answer these questions for yourself. Here are some rules, suggestions and laws of turning to get a better finish on the surface of your work:

1. Your tools must be sharp with a consistent repeatable angle. The angle for a bowl gouge will range from 40 degrees to 65 degrees. The angle for a spindle gouge will range from 15 to 45 degrees. The wood doesn't care because the wood cannot do trigonometry! To achieve a consistent bevel angle, you must use a jig of some kind. I use the Oneway Wolverine jig along with the Varigrind attachment, here is a link to King Heipful's shop built jig; https://www.finewoodworking.com/2002/05/01/king-heiples-shop-built-jig

    a. Laws of turning
    (Note: I will be referring to open and closed flute position. If you were to put a straight edge across the tool touching the top edges of the flute and imagine that straight edge as a clock hour hand then ***closed*** flute is when the straight edge is at 12 o'clock and ***open*** flute is when the straight edge is at 3 o'clock)
        i. A – Anchor the tool on the tool rest.
        ii. B – rub the Bevel, with the flute open to the 11 or 1 o'clock position, starting at the heel, no pushing just rub, then lift the handle of the tool in the direction the flute opens into while maintain contact with the wood and the tool rest.
        iii. C - while lifting the handle observe the cutting edge and continue lifting till the cut just starts, you will be able to see a little bit of shavings coming off of the wood.
            1. It is at this point that the tool is at the correct angle relative to the wood at the current diameter. If you have the tool handle held against your body with one hand and the other hand supplying down pressure on the tool to keep it on the tool rest then all you have to do is shift your weight from one foot to the other

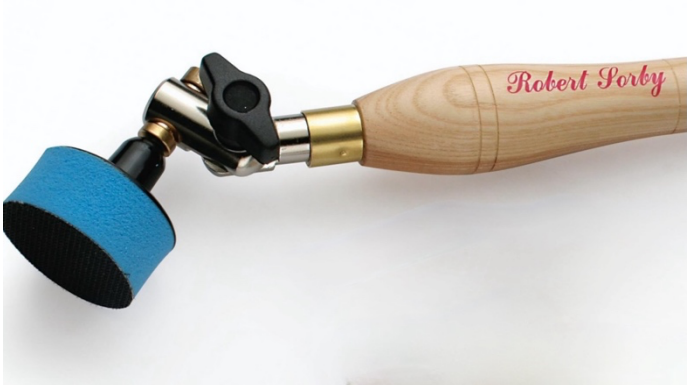
to make the tool move. Remember that the tool cuts in the direction the bevel is pointing.

b. Laws of cutting
    i. The cutting edge must be sharp
        1. You sharpen when the tool is not as sharp as it could be
    ii. The cutting edge does the cutting
        1. When entering the wood either the bevel is rubbing or the flute is closed and you make a line on the wood with the tip of the gouge, this makes a surface that the bevel can ride on, then you open the flute to an angle that is equal to 5 minutes on a clock face, i.e., from 12 to 1 or from 12 to 11 o'clock and then you push the tool to make the cut.
    iii. The cutting edge is not used for scraping, except:
        1. Shear scrape, this is where the flute almost points at the wood, the lower wing of the gouge is doing the cutting and the upper wing is held 1/16" from the wood. This cut is designed to remove just a *very slight* amount of wood, not for shaping where lots of wood is removed, much less than 1/16".

2. Grain supported cut direction, this is a little past a good idea or suggestion getting on toward a woodturning law;
    a. On the outside of a side grain bowl, you must push the gouge from the smaller diameter to the larger diameter
    b. On the inside of a side grain bowl, you must push the gouge from the larger diameter to the smaller diameter
    c. On a spindle turning always from a larger diameter to a smaller diameter
    d. On a spindle never directly into end grain
3. If after you do all of these things correctly you still have unacceptable end grain tear out then you should revert to a shear cut;
    a. Re-sharpen the gouge
    b. Drop the handle of the gouge quite a bit (45 degrees or more), you may need to adjust the tool rest height lower so as to keep cutting on center
    c. Roll the tool so that you will be cutting on the wing
    d. Rub the bevel and rotate the handle till you just start cutting
    e. Take very light continuous cuts across the surface to eliminate the end grain tear out

Ok, so, you got all of that and now want to sand your work anyway. What to do? The answer that I came up with was that I wanted an inertial or self powered sander. The first one that I ever saw and tried was the Robert Sorby model 410 Sand Master with the 8 1/2'" handle.

I used it on a large diameter turning and managed to get it going at a very fast speed. I had it touching near the center of the sand paper on the outside of the large turning thus the rotational speed of the sand paper was somewhat above the speed of a dental drill! The bushings couldn't handle that speed and the pressure that I was applying. I remarked, "Is this thing supposed to glow red?" Oh well, it wasn't my sander that lay smoking on the bench…



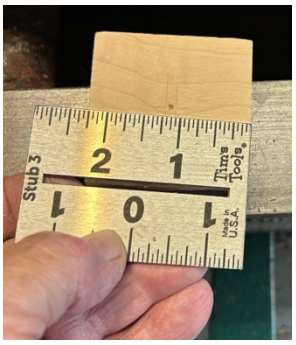
Here are some links to available inertial sanders:

https://woodturnerswonders.com/collections/inertia-sander

https://buffalowoodturningproducts.com/products/turner-turbo-wonder-inertia-sander
https://www.amazon.com/Sander-Sanding-Woodworking-Hardwood-Sandpaper/dp/B08HQQSVGG/ref=sr_1_3_sspa?keywords=inertia+sander&qid=1704746351&sr=8-3-spons&sp_csd=d2lkZ2V0TmFtZT1zcF9hdGY&psc=1
https://www.amazon.com/Turning-Sanding-Sander-Rotatable-Spindle/dp/B07QXMTVQF/ref=sr_1_5?keywords=inertia+sander&qid=1704746351&sr=8-5
https://www.amazon.com/Taytools-204055-Deluxe-Rotary-Adjustable/dp/B07BJZJYVH/ref=sr_1_29?keywords=inertia+sander&qid=1704746351&sr=8-29
https://www.rockler.com/robert-sorby-micro-sandmaster-set

However, you can make your own inertial sander for a couple of bucks, here is what you will need:

1 Short length of ¾" PVC tubing, either water or electrical, 8 to 12 inches long
1 skateboard or rollerblade bearing 608-2RS Ball Bearing available from many places, it is 8x22x7 mm and you want a sealed bearing. Here is a link for one.
https://vxb.com/products/skate-bearing-just-one-608-2rs
1 5/16" bolt 1 ¼" long on which you have made a screwdriver slot on the threaded end
1 5/16" nylock nut
1 5/16" id plastic bushing about 3/16" long
1 2" square by ¾" hardwood scrap, 3 inch square if you want to make a sander for 3 inch paper.
1 2" square piece of locking antifatigue mat
1 2" square piece of Velcro hook self-stick material
Contact cement
1 22 mm Forstner bit, can be made by grinding down a 7/8" bit to 22 mm by putting the bit in a Jacobs chuck in the lathe and then using a Dremel tool with a stone to reduce the diameter to 22 mm while the lathe is rotating slowly.
1 5/8" Forstner bit
3 #4 x ½" pan head sheet metal screws
1 1/16" drill bit



Directions:

1. Find the center of the 2" square hardwood
2. Drill 7 mm deep with the 22 mm Forstner bit
3. Drill for bolt head clearance with the 5/8" Forstner bit in the center of the 22 mm hole
4. Make a tenon on a small piece of wood aprox 2", put it in the chuck and face off the end
5. Using the above put the 2x2x3/4" piece against the face and hold in place with the tailstock
6. Turn the 2x2 round and give it a profile that is concave

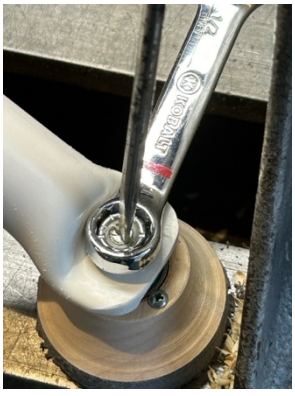
7 Using contact cement glue the antifatigue mat to the now round 2” wood. If the mat is old you may want to sand the smooth side a little to remove any oxidized material and dirt

8 Put the bearing into the 22 mm hole and drill 3 holes with the 1/16” bit 120 degrees apart such that the side of the drilled hole is almost in contact with the bearing.
9 Remove the bearing and place it on the 5/16” bolt and re-insert it in the 22 mm hole
10 Screw in the 3 #4 screws to lock the bearing in place

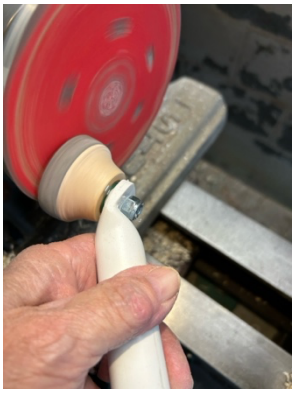
11 Heat one end of the ¾” PVC tubing with a hot air gun until the PVC is soft. Don’t use a torch because PVC gives off toxic fumes when burning.
12 Clamp about 1 inch in a squeeze clamp and hold the tubing at a 45 degree angle till it cools off

13 Drill a 5/16” hole in the center of the flat area of the tubing
14 Round off the end of the flat area on a sander, belt or disc

15 Put the bushing on the 5/16” bolt and then use the nyloc nut to fasten it to the PVC handle



16 Using a disc sander allow the sanding head to rotate against the sandpaper to smooth off the dimples off of the pad



17 Put a thin layer of contact cement on the mat and allow it to dry
18 Put the Velcro hooks on the mat and trim with scissors