Router feed direction and bit rotation

I recently purchased a set of Rockler’s Bench Cookies. I’ve been reading about them all over the internet and no doubt I’m probably the last woodworker in the world to have purchased a set — I was excited to try them out and thought I would combine it with an article about router feed direction and bit rotation.

I use a router a lot in my workshop, both hand held and table router. However, I can remember when I got my first router and the learning curve I went through figuring out which direction to move the router when routing by hand or the workpiece when routing on the table router. Hopefully I can help others out and make that learning curve not quite as exciting!

Essentially the workpiece always needs to be feed into the bit, so the first thing you need to know is which way is the bit rotating. Let’s deal with the table mounter router first. Hold out your right hand in a classic “thumbs up” gesture. Imagine your hand is the router and your right thumb is the router bit. The direction of the router bit follows the curve of your fingers. In this case, it is counter clockwise. You can see this clearly in the picture below.
Now rotate your right hand into a “thumbs down” gesture. Again imagine your hand is the router and your right thumb is the router bit. The direction of the router bit is still indicated by the curve of your fingers, in this case it is clockwise. You can see this in the picture below.

This “right-hand thumb rule” applies to almost anything that spins, faucets, right hand thread screws etc.

So, moving back to the router table, you can see that in order to feed the workpiece into the router bit, you need to feed from right to left, assuming you are standing facing the fence. By feeding from right to left you are feeding the workpiece against the direction of rotation of the bit. The natural reaction as the workpiece contacts with the bit is to push the workpiece back towards you. By controlling the workpiece, by hand and through the use of featherboards, you prevent this from happening.

Feeding from left to right, the rotation of the bit would grab the workpiece and pull it forcefully from right to left. This can happen in the blink of an eye and the danger is, aside from ruining the workpiece, that you don’t release it and your fingers are pulled towards the router bit.
For the same reason the fence always needs to be positioned so that side of the router bit that is furthest away from the fence is doing the cutting. To illustrate, suppose you need to route a groove or dado that is 1” wide, but the largest bit you have is a 3/4” straight bit. Obviously the groove will have to be cut with two passes. The first pass will form a 3/4” groove and then the fence can be moved 1/4” in order to make the groove a full 1” wide after the second pass. No problem.

However, it is very important that the fence be moved in the right direction before the second pass. Moving the fence closer to the router bit would mean that the side of the router bit that is closest to the fence is doing the cutting. Remember the way the bit is rotating? This would cause the bit to pull the workpiece away from you forcefully. The following picture shows what not to do!!

The correct method is to move the fence away from the router bit so that the 1/4” section of the groove you are removing
with the second pass is on the side of the router bit farthest from the fence. The following picture show the correct position of the fence relative to the router bit. By setting up for the second pass this way you are once again feeding the workpiece into the direction of rotation of the bit.

Cuts like this need to be planned very carefully to ensure that the correct side of the router bit is doing the cutting.

Moving back to the hand held router, there are two different scenarios which determine feed direction. Imagine a circular picture frame that you need to profile both the external and internal edges of. Which direction to you rout?

Hold your right hand out again with fingers closed except your thumb and index finger. Imagine your hand is the router. If your right thumb is pointing to the workpiece then your index finger is showing the direction of travel of the router. Take a look at the picture below.

You can see that when routing the outside edge of the picture
frame, you need to move the router in a counter clockwise direction. When routing the inside edge of the picture frame, you need to move the router in a clockwise direction.

I have found these two “right hand” memory aids very useful in determining router bit rotation and router feed direction. I hope you do to.

I’ll end the article with a short video clip showing the Rockler Bench Cookies supporting a workpiece I was making some test cuts on. I found they held the workpiece securely and it was nice to have it raised above the table. I did find that I needed to lightly support the workpiece with my inboard hand to prevent it from tipping slightly. I’m sure that if the workpiece was wider or if I had been using an offset base on the router, this would not have been necessary. I can also see the Bench Cookies will be useful for other applications, sanding and finishing are two that come to mind.

In full disclosure, the links are affiliate links. If you purchase anything from Rockler via the links, Rockler will send me buckets of money and I’ll be able to quit my day job and play in my workshop every day. Not necessarily a bad thing.