

Cutting Round Corners with Scissors, Version 1.1

By **R. G. Sparber**

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Sometimes mundane tasks can reveal interesting problems if you pay attention. I wanted to round a corner on a piece of paper. A disk as my template could guide scissors.

The resulting cut didn't perfectly follow the disk. My first thought was that the disk wasn't thick enough. Making it $\frac{1}{2}$ inch tall would fully support the top blade of my scissors.

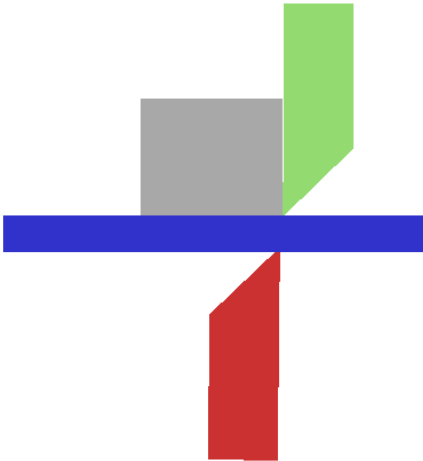
I had the flank of the scissors tight against the new disk, yet it would not stay there. Instead, the top blade would drift away with each snip. It wasn't much, but it was consistent.

What is going on? Is there something to learn?

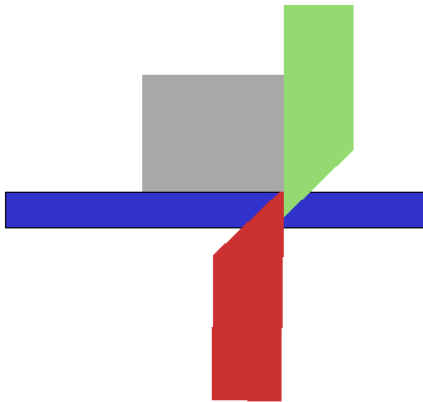


I can model my paper as a blue rectangle. My disk is a gray square. My scissors have an upper blade (**green**) and a lower blade (**red**). As they pass, the blades shear the paper.

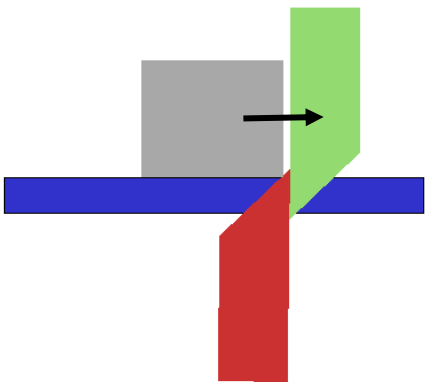
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I place the top blade of the scissors against the disk.

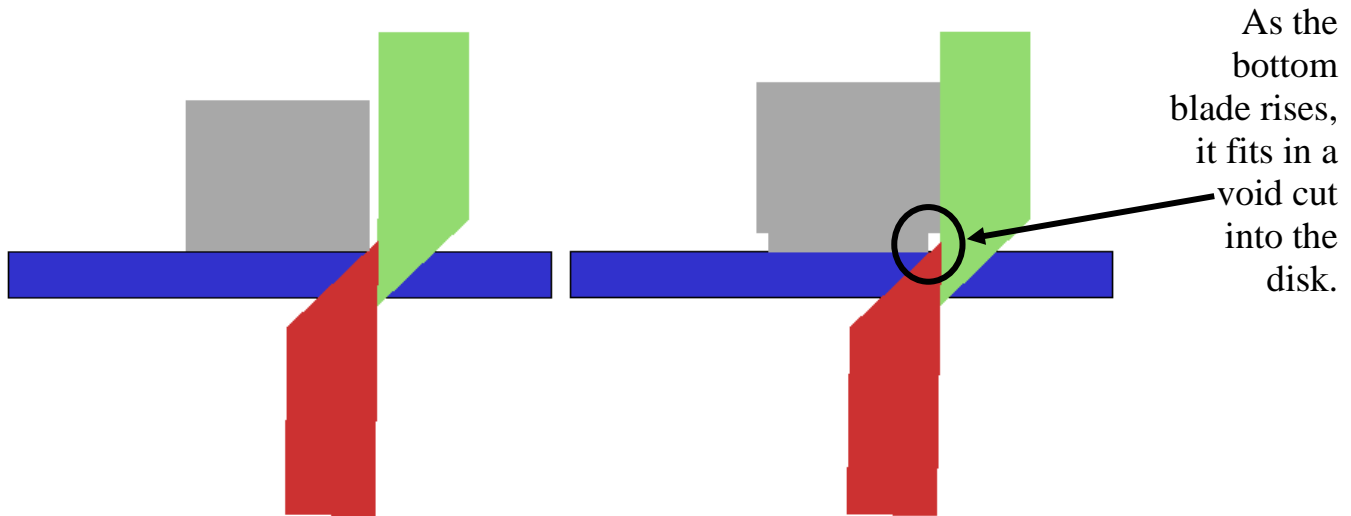


As I squeeze the blades together, the top blade slides down the outside diameter of the disk. But the bottom blade rises *under* the disk.



When the paper shears, the bottom blade has jacked the top blade away from the disk. The result is a jagged edge on the paper. The cut starts on the arc defined by the disk but drifts off of it on each snip.

Once I understood the problem, the solution jumped out at me. I needed to make space for the bottom blade.



So much for the theory; here is the hardware. I reduced the disk's diameter by about 0.2 inches for a height of about 0.1 inches.



As I started to use the template, I found that it tended to slide around on the paper unless I squeezed hard. A magnet on the paper's underside worked but had a problem. When the scissors got close, the magnet pulled towards it and stuck.



My solution was to use double-sided tape to attach a disk of 600 grit emery cloth to the bottom of the disk. This roughness is enough to prevent sliding while using a gentle holding force from my fingers.



After some practice, I found it best to make a series of short snips.

As long as the flank of the top blade was against my disk, all cuts were either on the final arc or away from it. There were no undercuts.



Two or three passes and nothing sticks out. One pass will be good enough for some jobs.

The easiest way to set the disk tangent to the edge of the paper is to put both on edge and rest them on the tabletop. I either rotate the paper and disk 90° and repeat the process or align the second edge by eye.

I don't know how often I will use this disk, but exercising my mind is always worthwhile.

Dave Kellogg offered a few insights:

- If the puck is positioned on the back side of the paper, the lower blade will contact it, and the upper blade will not come near it. The one challenge with this approach is that you must offset the puck by the thickness of the blade so that the resulting cut is tangent to the edge of the paper.
- Use an Xacto knife to cut around the puck. If the knife and puck are on the same side of the paper, cut against a cutting board with no grain. If the edge of the puck is crisp, then place the puck on the back of the paper and use the knife from the top of the paper. In this case, the edge of the puck is effectively one of the scissor blades.

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Rick Sparber

Rgsparber.ha@gmail.com

Rick.Sparber.org