Nautical Line Winding Fixture, Version 1.1

By R. G. Sparber

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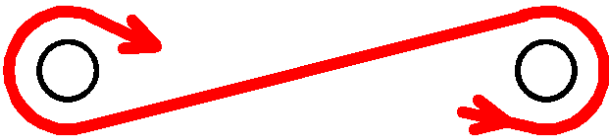
I am a rank novice when it comes to boating. I learned to paddle my kayak from Paddle TV on YouTube. I learned how to properly coil up a line from several other videos. The bottom line is that braided line should not be coiled in a circle. There should be no net direction.



Think of it as coiling in a figure 8. On the right side, I went counterclockwise, which means on the left side, I must go clockwise. My bend on the right puts a half twist in the line, and my bend on the left takes it out.

Compare the figure 8 to just coiling up the line. On the right side, I go counterclockwise. But on the left, I also go counterclockwise. The result is that the line now contains a full twist. These twists add up, and I end up with a snarl when the line is later played out.

For large diameter ropes, this is easy to do with just your hands, as shown in this video from West Marine (https://www.youtube.com/watch?v=K-TV9cnzI3E). But for small lines, it isn't so easy for me.

My solution is to make a fixture to provide the extra hands. This is a proof-of-concept, so it is not pretty. Yet it does work well. The final iteration will not need to be mounted in a bench vise.

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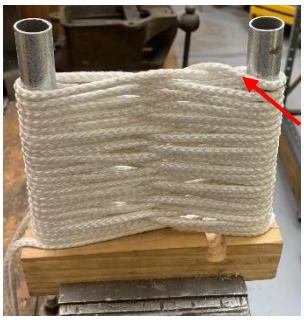
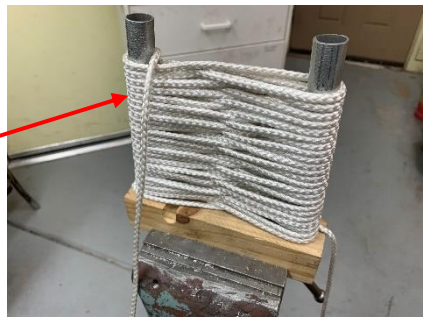
The fixture consists of two 6-inch lengths of electrical conduit and a block of wood. I drilled two ¾-inch holes halfway into the block to hold the conduit. They are a snug fit but do wobble. I also drilled a ½-inch hole on the flank and then sawed from the top to create a channel.

My line is longer than the capacity of the fixture, and I didn't want to cut it just for this article. So assume the end of the line is even with the left post.

I loosely form my figure 8s. Even then, there will be enough force on the posts to cause them to tilt in a little. This is a feature and not a bug. This will make it easier to lift the bundle off of the posts.



I'm done coiling the line. Note that the end of the line
runs around the right post and then over the backside of the bundle.



I feed the end of the line through the channel and

out the front.

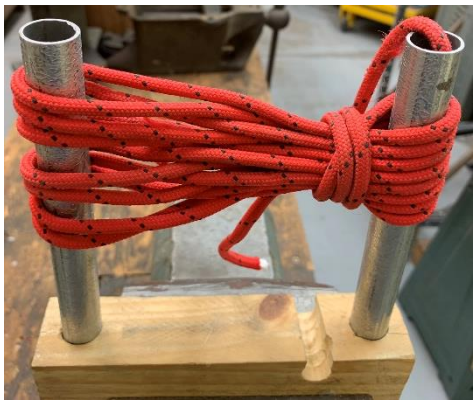
I make one wrap around the bundle taking care to cross the line. As I pull on the end of the line, I start to compress the layers.

While holding the line with my thumb, I feed the end down the post.

As I lift the bundle off of the posts, the end of the line can be seen extending out the bottom.

As I pull on the end of the rope, the wrap tightens, and I have my nice, neat package.

To unbundle, I pull the end of the rope back through the loops and remove the two wraps. The rest then falls apart with no twists.



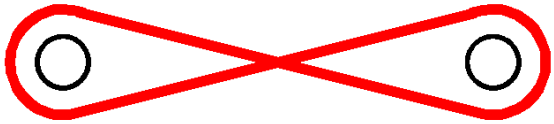
The fixture also works for shorter lines.

Designing the Fixture

I will start by looking at the bundle I just created and then generalize the math to a design equation.

I coiled up a 3/16-inch diameter woven line. When done, the line was wrapped to a height of 5-inches[2]. This means

$\frac{5\ inches}{\left(\frac{3}{16} inches\right)} = \frac{5 \times 16}{3} = 26.7$ layers. Call it 26 layers.



One of these figure 8s takes up approximately a circumference of the conduit plus twice the distance between centers.

For my fixture, the conduit diameter is ¾-inch, which means a circumference of $\pi D = 3.14 \times \frac{3}{4}\ inches = 2.36$. The distance between centers is 5 ½ -inches. Therefore, I consume $2.36 + \left(2 \times 5\frac{1}{2}\right)$ = 13.36-inches per pass. When I make 26 passes, I have coiled up 347-inches, which is about 29-feet. The general equation is:

$$maximum\ capacity = \frac{wrap\ height}{line\ diameter} \times (\{3.14 \times post\ diameter\} + \{2 \times post\ spacing\}) \qquad (1)$$

All values are in inches. After dividing the wrap height by the line diameter, round down to the next smaller integer.

I can recast (1) to help me design a fixture given the maximum length of line plus its diameter. I will assume you have chosen the wrap height and post diameter.

$$post\ spacing = \frac{maximum\ line\ length}{2 \times \left[\frac{wrap\ height}{line\ diameter} \times (3.14 \times post\ diameter)\right]} \qquad (2)$$

[2] Notice that the post is about 1-inch taller than the wrap height.

John Herrmann and “hemmjo” from homemadetools.net suggested that short lengths of thin line can be wound up on the fingers. This has the significant advantage of not needing a fixture.

As per their instructions, I figure 8 wound the line around my thumb and pointer fingers.

Then I wrapped the end around the bundle a few times.

After sliding the bundle off of my fingers, I fed the end through the loops at one end.

This was easy to do and quick.

If you are OCD, the uneven loops on the left end may bother you. For the rest of us, this procedure is a winner.

John and hemmjo prove, again, that all of us are smarter than any one of us.

I welcome your comments and questions.

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