An HJS Studio Tutorial:

To Chose or Not to Choose an Electric Spinner

Introduction

I've been spinning since March 1986, when I got started with a homemade drop spindle, some very coarse and ugly carded wool, and a little booklet about drop spinning—almost as low-tech as you can get.

Today I'm the happy owner of an electric spinner, which I use almost exclusively. I still drop spin, especially with very fine, short fibers, and still use my Ashford Traveller when I won't be around electricity, but the espinner is my prime choice for all other spinning. This page is for those who are contemplating purchasing an espinner, those who can't understand why someone would use an espinner, and production spinners with speed on their minds. I welcome specific questions; contact me any time if you think I can help.

Reasons to get an espinner seem to fall into two main categories: Speed, and physical need.

Speed

I approached the purchase of an espinner from the speed point of view, and have learned a lot along the way about what speed really is on any spinning device.

A brief diversion to explain what the ratio on a wheel is. It's essentially the number of times the flyer turns each time the drive wheel is turned one time. It's expressed so: 30:1 (read as "thirty to one") which means your flyer turned 30 times for one full turn of the drive wheel. Each turn of the flyer puts one twist into your fiber. The higher the flyer to wheel ratio, the faster you can potentially spin a give length of yarn with a given number of twists.

I upgraded my Ashford Traveller with the Lace Flyer as soon as it became available in the US. The Lace Flyer's top ratio is 30:1 on this wheel (the previous top ratio was around 10:1). It took very little time for me to adjust my spinning to suit the additional speed. I did have some problems, though. Winding on yarns that weren't worsted spun and very fine was a real headache, as any stray fiber got caught on the smaller guide hooks.

I borrowed a friend's Lendrum with the Very Very Fast Flyer (ratio 45:1), but didn't care for it. I'm a confirmed single-treadle long-draw spinner, which the Lendrum doesn't allow for very well, and found the jump from 30:1 to 45:1 was not as much as I'd hoped, certainly not enough to want to put up with the various disadvantages I perceived with that wheel for my spinning style.

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Finally I decided to invest in a Rio Grande treadle point spinning wheel, which has a special spindle whorl available with a ratio of up to 48:1. Again, I had no trouble spinning at that speed, but never managed to get the hang of the 'flip' needed to wind yarns on while still rotating the wheel in the spinning direction. I also found it somewhat difficult to treadle at the 48:1 ratio. It's a wheel I highly recommend for folks production spinning bulky or highly textured yarns using the standard spindle whorl, but for my purposes it didn't work very well, and I have since sold the wheel, though it is one beautiful piece of equipment.

Note: This is not about winning speed-spinning contests, or being competitive in any way. It's about finding out what speed you are comfortable spinning at so you can assess espinner speed (or treadle-wheel ratios, for that matter) more accurately. There are few things more frustrating than find out the espinner you bought because the ad said "fast enough for spinners of all ability levels" only to find it's really very slow for you. Such pieces of equipment rarely resell for what you paid new.

How fast can you spin *really*?

Email correspondence with Alden Amos and others taught me that high ratios aren't the only consideration when choosing a spinning device for speed. What really counts is how many revolutions per minute you get with your flyer or spindle, particularly at your spinning comfort level with the spinning device you're using.

The flyer-to-wheel ratio of a standard spinning wheel gives you the approximate number of times the flyer turns with one full turn of the drive wheel. The official ratio advertisements quote is not always exactly what you get when you actually spin. The band may slip a bit, the whorl may not be exactly the right depth, and other factors may slightly reduce the number of turns of the flyer. If you find that the ratio is significantly different from what you were led to expect, be sure to go back to the company that made the wheel. There may be something wrong with the flyer you have. This happened to me once, and the company sent a replacement, which had a ratio exactly where it should have been.

The true speed (in rpm, or revolutions per minute) of your wheel has to do with the number of turns the flyer makes per full revolution of the drive wheel, times the number of times you can treadle (or turn a hand-turned wheel like a charkha or great wheel) in one minute.

How fast your flyer flies

To find out what your flyer/spindle to wheel ratio really is, try this simple exercise (which I was told by Alden Amos):

1. Tie a piece of yarn to one arm of the flyer. If you have a spindle wheel, tape a piece of yarn to one point on the back of the spindle.
2. Arrange the flyer/spindle so the yarn is at the top.
3. Note a point on the drive wheel--perhaps attach another piece of yarn if the wheel is large. Or position the wheel so that the footman is exactly vertical.
4. Turn the wheel slowly, one full turn, so it stops at exactly the same position it started at.
5. At the same time, count how many times the yarn marker on the flyer comes back to the top.

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6. If you're really precise, count the fraction of a turn the flyer makes (if any) when the wheel is exactly back to its starting position.
7. The number of turns the flyer makes is the true spinning ratio for that whorl on that wheel.

This process works as well on double-drive wheels as on scotch tension wheels, and it works on wheels with accelerator wheels. You can repeat the process for every whorl/wheel combination available to you, if you wish. Some wheels have a dozen or more ratios possible, though how to keep track of which combination a given ratio applies to is beyond me! :)

How fast you can treadle

The next issue is how fast can you treadle at top speed, what's your best sustainable speed, and what's your most common, comfortable speed? Every wheel has different requirements for treadling. Some are easy and comfortable, some quite difficult. Frequently, changing ratios on the flyer will change the level of comfort while treadling. The Rio Grande was quite challenging for me to treadle at the 48:1 ratio, although it was a breeze at lower spindle speeds.

Alden Amos recommended I do a speed test. Set a timer for 5 or 10 minutes. Count your treadles as you spin--whether single or double treadle, count how many times one particular foot (in other words, don't count both feet if double treadling) pushes the treadle down, as that represents one full turn of the drive wheel. How fast can you treadle while spinning something that you find fast and easy to spin? How fast do you normally treadle? How fast can you treadle sustainably for longer periods? Divide the total number of treadles you count by the number of minutes the timer ran for, to determine your treadles per minute speed.

I found that, with the Ashford Traveller, I could treadle (while spinning) up to 100 times per minute, but that my comfortable, sustainable, habitual speed was about 60 treadles per minute. With the RG, my fastest speed was about 100 times per minute, but it was difficult to keep up because the treadling was hard. About 50 was my sustainable speed with the spindle on the 48:1 ratio.

Putting the two together

To find out how many revolutions per minute you are actually getting with your wheel, multiply your actual ratio (the number of times the flyer turned with one turn of the wheel) by the number of times you can treadle your wheel in one minute. Some examples from my wheels and various ratios:

- 100 treadles per minute x a ratio of 10:1 = 100 x 10 = 1000 revolutions per minute (rpm)
- 60 treadles per minute x 30:1 = 1800 rpm
- 50 treadles per minute x 48:1 = 2400 rpm
- 100 treadles per minute x 30:1 = 3000 rpm

To put these numbers into perspective, let's suppose I'm spinning a yarn that has 6 twists in one inch (2.54 cm) (about what I do for 3 ply sock yarn at 18 wraps per inch / 7 wraps per cm). These numbers are theoretical. They don't allow for stopping to pick up a new fiber

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supply, move the yarn from one hook to the next, adjust the take up, etc. Real life handspinning is always slower, since we're not machines :)

- At 1000 rpm, I can spin 166 inches (421 cm) of yarn in one minute: 1000 rpm / 6 twists per inch.
- At 1800 rpm, I can spin 300 inches (762 cm) of yarn in one minute: 1800 rpm / 6 tpi.
- At 2400 rpm, I can spin 400 inches (1016 cm) of yarn in one minute: 2400 rpm / 6 tpi.
- And at 3000 rpm, I can spin 500 inches (1270 cm) of yarn in one minute: 3000 rpm / 6 tpi.

These equate to about 276, 500, 666, and 833 yards (252, 457, 609, 762 meters) in an hour, if I don't have to stop to adjust anything. Realistically, my spinning productivity is lower. I rarely spin more than 500 yards / 457 meters in an hour, working at what is probably about 2500 rpm. But you can see the significant production differences available when the ratio is increased.

This experimentation taught me that I could easily spin at 3000 rpm, but that I couldn't get that speed on my Ashford Traveller with Lace Flyer for more than a few minutes at a time because my leg wasn't up to it. It also gave me something to aim for when looking at espinner speeds. I now knew that any motor at 3000 rpm or less wouldn't do me much good. That narrowed the search for an effective espinner for my situation quite a bit.

Espinner speed

Now you can compare the speed of your wheel spinning to the speed of a motor that comes with an espinner, at least in some circumstances. For example, if you find that you normally spin comfortably at 1000 rpm, and are happy at that speed, then a 1500 rpm espinner may be just the thing for you. On the other hand, if you comfortably spin at 3000 rpm, and want to push the limit in your spinning, you need an espinner that will deliver 4000 or more rpm.

Espinners have ratio issues, too. If the drive wheel groove is exactly the same circumference as the flyer whorl groove, the ratio is 1:1. That ratio would mean the motor speed, say 1500 rpm, is exactly the same as the flyer speed. Usually the flyer whorl is rather larger than the drive wheel. The more the difference in size, the slower the flyer will turn relative to the motor speed.

For example, on my espinner, the flyer whorl travels (very approximate estimate) about .75 turns for every one full turn of the drive wheel. So if the top speed of my espinner's motor is 5000 rpm, the top speed of the flyer might be as little as 3750 rpm. However, since I don't have to stop and start all the time to disengage fibers from the guide hooks, I still have a lot more productivity on the espinner than on my Traveller, aside from not having the wear-and-tear of treadling. And someday I hope to upgrade to the model that has a Woolee Winder, to leave hooks behind entirely.

I have never seen an espinner with information available on the ratio, or the actual flyer speed available at various motor speeds, and you can't figure it out for yourself nearly as easily as you can a standard spinning wheel, though perhaps you could very carefully figure the circumference of the base of the flyer whorl grove compared to the base of the drive wheel groove. Some espinners don't even offer information on the motor speed, or the information is inconsistent, perhaps reflecting different motors being used. I personally find that

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very frustrating, as speed is one major reason why spinners consider electric spinning devices.

A plea to any manufacturers of espinners: Please keep in mind that 1500, 1800, even 3000 rpm is not fast enough for all spinners, even at a 1:1 ratio. If your espinner speed is infinitely variable between zero and its top speed, please put in a motor that can go at least 5000 rpm, and make sure the ratio between flyer whorl and drive wheel is at least 1:1. Or use the slower motor, but a larger drive wheel, to give a speed of 4000 or more rpm possible for the flyer. When I've made inquiries about these issues, I've usually gotten vague responses like "fast enough for all spinners, no matter what level" and "faster than any treadle wheel". Those types of answers about the speed of the espinner really don't cut it. Being motor driven instead of treadle driven does **NOT** guarantee greater speed in spinning.

Further note: Some espinners are direct drive in that the motor drives the flyer without using a driveband. In these cases, the speed of the flyer should be the speed of the motor.

Physical Needs

Ironically, although I didn't feel the need to stop or reduce treadling while actively using my Ashford Traveller, today I recognize that the espinner relieves me of a lot of wear and tear. I had to send back my espinner for work one time; it was gone about two weeks. My leg and hip were both bothering me quite a bit from the treadling by the end of that time. Even if you don't have pain from lots of treadling right now, you may find that you're stressing your legs and hips more than you realize, and that may come back to haunt you when you're older.

Some people turn to espinners because you can take almost any posture and still spin comfortably. One friend of mine has chronic back problems. Using an espinner allows her to continue spinning, whereas a treadle wheel was exacerbating her pain because she had to sit in a particular position to use it. Since legs and feet aren't needed, other than to help stay on a chair or stool while spinning, espinners help handspinners continue their craft even if disease or accident has reduced their mobility. For the rest of you, you just won't believe how comfortable it is to spin while sitting with your feet up until you've tried it!

Some challenges in using an espinner may come from the position or type of controls. Some have sewing-machine foot speed controls, which may be impossible for a spinner who can't use her legs or feet. I would imagine muscle cramping could be a problem for a production spinner using the sewing-machine type control, too. At least, it is for me when machine sewing, and I don't sew nearly as steadily as I spin!

Most espinners seem to have hand-operated controls to turn the motor on, adjust its speed, and turn it off, as well as for spin direction and scotch tension adjustment. It's important to sit down and spin at an espinner, and try those controls, to see if with your spinning style the controls will work for you.

For example, my espinner has the controls on the right, the flyer on the left. Since I hold the fiber and draft with my left hand, this works well for me. A person with a right handed draft will probably find it somewhat awkward, and controls centered below the flyer might be a better option. I can spin holding the fiber in the right hand, having tried it just for the heck of it, and a spinner suited by a given espinner in all but that area might consider switching drafting hands. Spinning is essentially an ambidextrous activity; if you can draft with one hand, a lit-

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tle practice will allow you to draft with the other if you don't have a physical disability with the other hand. Left-handed drafting also allows an easy switch to spindle wheels (Rio Grande, charkhas, great wheels, etc).

One concern I had that isn't often mentioned in discussions of physical need and espinners is the amount of noise they make. I am very sensitive to droning and loud noises. I had tried one well-known espinner before buying the one I have, and aside from being slow, it was also very loud. The espinner I use today is very quiet—in fact, if I take the drive band off so just the motor is running, it's almost completely silent. Most noise comes from the flyer and bobbin.

Other considerations

Other factors to consider before deciding to get an espinner, or choosing a particular model:

- Do you have a consistent supply of electricity?
- Can you plug in your espinner without having to string extension cords all over the house?
- Do you have a stable surface to set it on, that is also a good height for comfortable spinning? I use a wooden TV tray, which is wobbly enough that it wouldn't be ideal in a household with small children or large animals.
- Is the espinner you chose quiet enough for you and for any other people living or working with you?
- Is the brake tension easy to set and with a good range of take-up options, so you can spin both lightly twisted yarns and yarn from slippery fibers as easily as tightly twisted yarns?
- Is the orifice easy to thread, and the guide hooks easy to move yarn through, assuming your espinner has these?
- Are you comfortable with the position of the speed control, on/off, etc?
- Does the bobbin hold a reasonable amount of yarn for the type of spinning you most often do?
- Are additional bobbins reasonably priced and easy to buy?
- Can you adjust and replace the drive and brake bands easily?
- How easy is it to change bobbins?
- What kind of maintenance does the espinner need?
- Does the espinner overheat if continuously used for long periods?
- Is it easy to transport, both regarding weight, shape, and size?
- Is it sturdy enough to take with you to other locations?
- What kind of guarantee is offered on the espinner?
- How long will repairs likely take before you get it back, if that's necessary?
- Is the manufacturer likely to still be in business a few years from now?
- Are the aesthetics of treadling and looking at a foot-powered or hand-turned wheel more important to you than whatever an espinner might offer in exchange? Consider this question very carefully, and if at all possible, try some espinners before you make your decision. You might surprise yourself!

Conclusion

Espinners aren't for everyone, and not every espinner is a good buy. While speed is not the only reason to choose an espinner, many handspinners do make the change from treadle to

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motor in order to increase their spinning speed. With the wide variety of relatively fast-ratio treadle-powered spinning wheels available, when spinners look for more speed, they generally want more than 3000 rpm. More is better—you can adjust an espinner to go as slowly as you like, after all, so why not have a top speed faster than you think you'd ever use? Skill comes with practice, and you may find some day that you can spin much faster than you thought possible. Espinners are just as expensive as treadle wheels. Don't buy one that will hold back your spinning productivity.

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