

Roughly Polished



...and why should we care.

Let me start describing my job when I was taking care of polishing and quality check in a gut strings factory.

I had on my table bundles of strings, each of them coming from a specific number of strands.

As an example, let say I had something like 100 strings made out of 5 strands.

In front of me, the grinding machine.



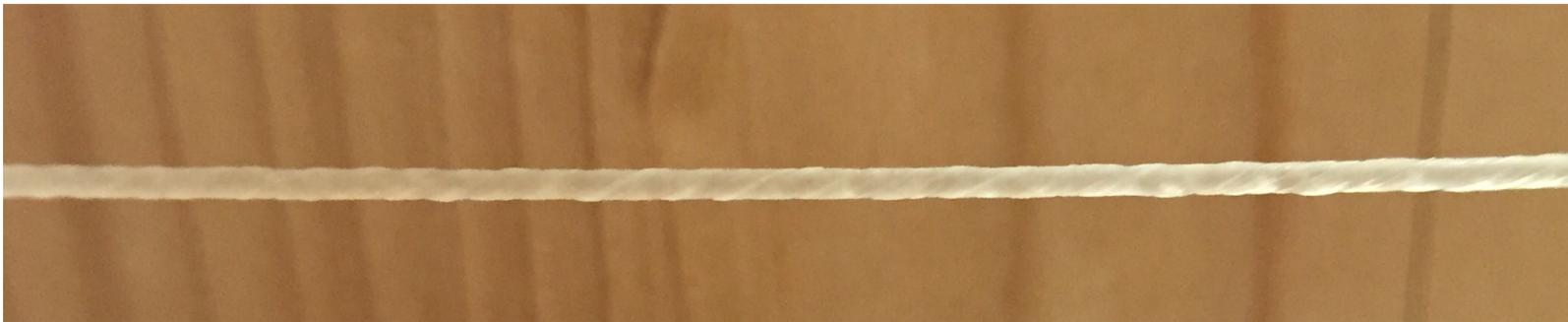
The grinding machine has two stone wheels. One wheel “takes” the string and pushes it forward while the other scrapes it, both of them rotating fast and impressing this rotation to the string. The distance of the two wheels is what determines the outcoming gauge of the string, and this is what I constantly need to set up.

The first thing I do is selecting by eye the biggest strings and measure them, so to settle the grinding machine at a slightly wider measure for the first round. If I measured 92, I would set it at 94.



This way, the machine would cut away the big imperfections like grease bubbles and lumps. Most of the strings won't be touched at all by the grinding wheel at this first passage.

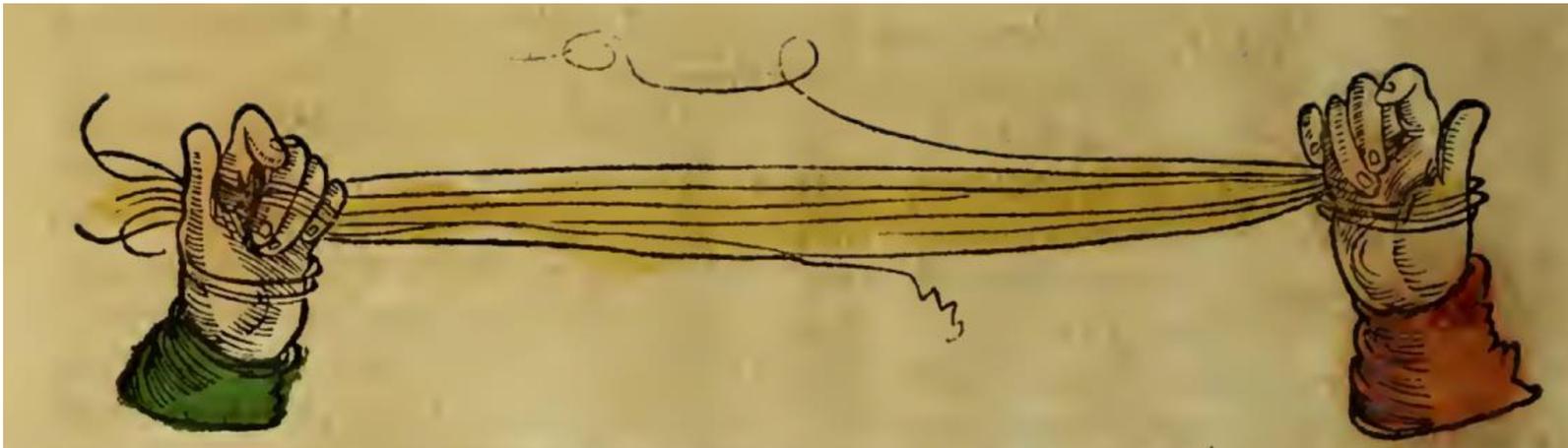
Then, I would set it at 91 and push in all of my strings again. Some of them would be touched by the wheels, still most of them not. The polishing process is definitely on its way.



A rough string and one partially polished



Third round: the machine is set as 88, and I still have all of my 100 strings on the table. While pushing them in, I feel with my fingers if they have been partly polished or not, and in the case, if they seem evenly touched through the whole length, I stretch them between my fingers and check them at the “Mersenne’s test”. If they are good, I will take them out, to put them with their label on the packaging table.

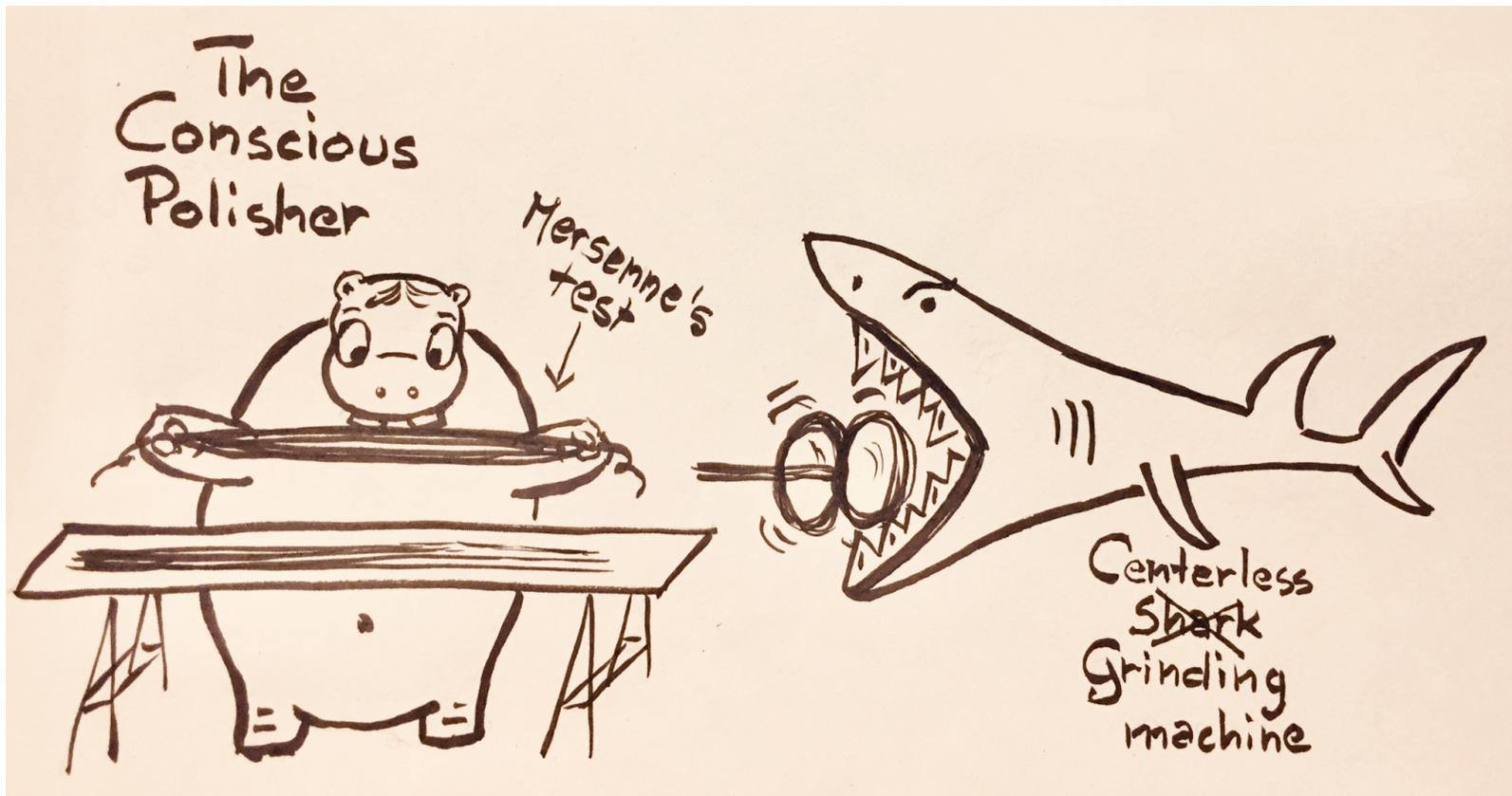


Sebastian Virdung, *Musica getutscht und ausgezogen* (1511)

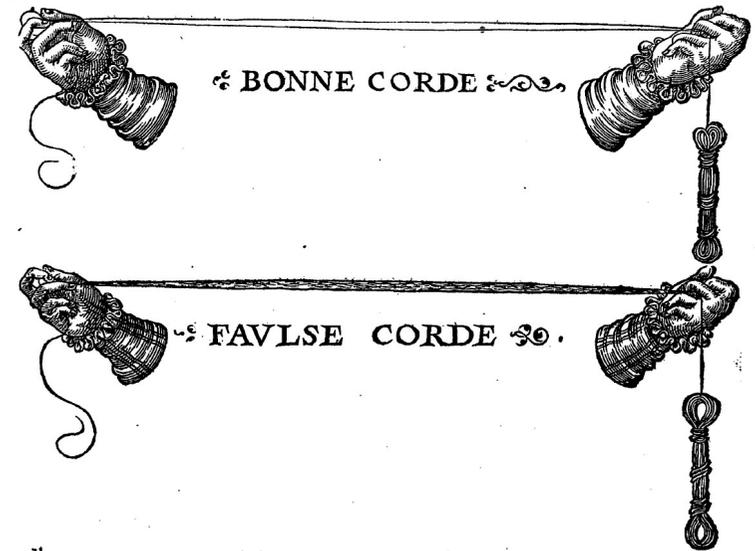
However, on 100 strings, maybe 2 are good and done at this early stage. All the others are regularly passed into the grinding machine at 88.

On the next round, I set the machine at 85. This time, one by one, I check them at the Mersenne's test. The good ones go on the packaging table, the not-so-good ones and false ones are pushed into the machine, to be scraped at 85.

At this passage 7-10 strings are taken apart, checked once again to see if they have been scraped (so they are definitely 88) or not (in that case, measured and differently labeled). The remaining 90 strings are going into the grinding machine, to be scraped at 85.



The same process is applied with the machine set at 82, where a consistent number of strings are taken out as ready. Some of them are still a bit rough, while very few, one or two, are already smooth, and of course, they receive their label.
...and I go down, closing the wheels of the grinding machine, at 79, then 76...
...most of the strings are out now, but still, some are not even at the Mersenne's test, and they will not be until they are completely smooth...
In the end, on the last round, I only have 4 or 5 smooth strings, maybe to become 73. If one string is smooth and still not even at the Mersenne's test, it is discharged.



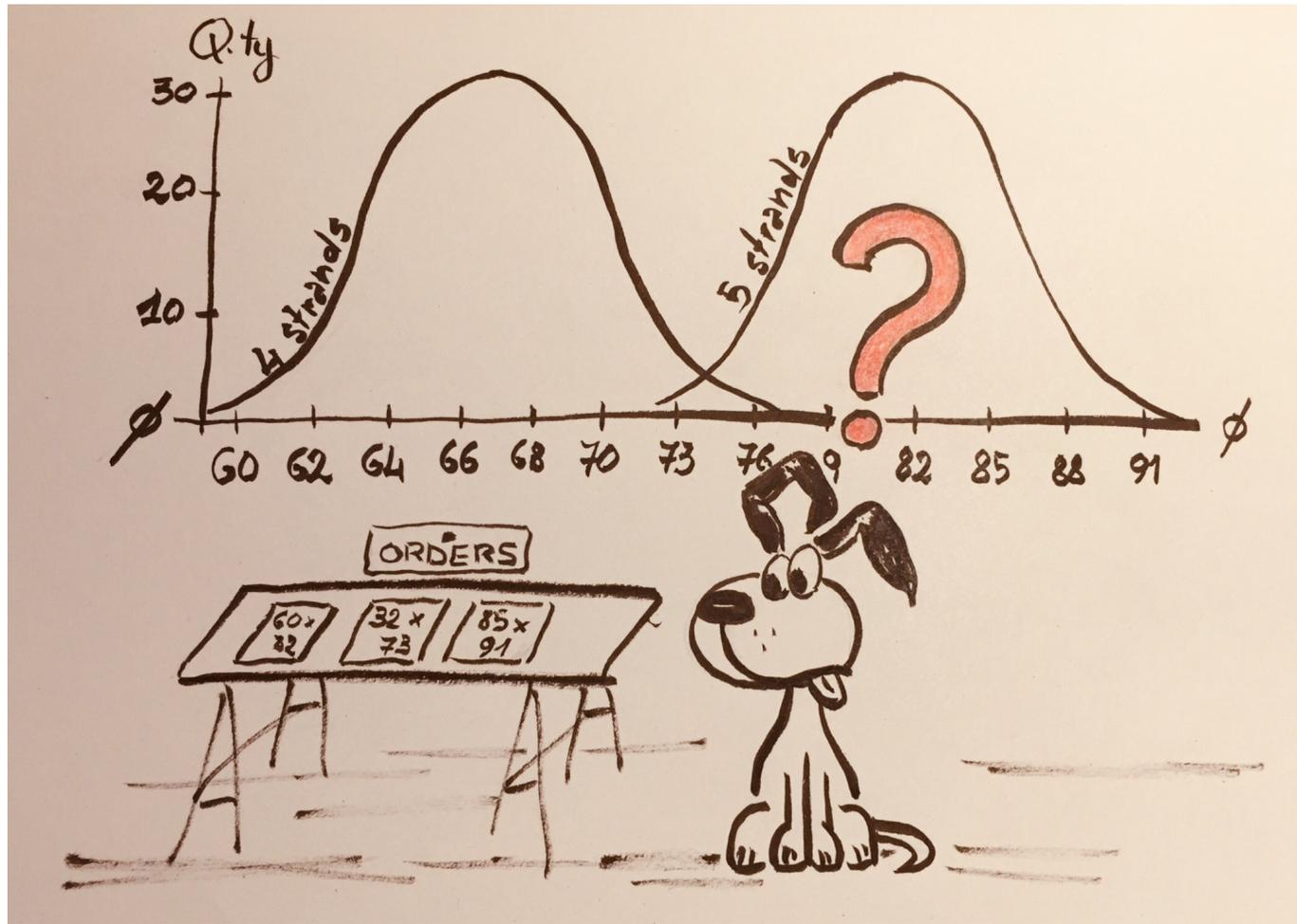
If I ended up with a big quantity of rough 88 but I had on order smooth 82, I simply need to polish them to that measure. But if I do not have enough 88 to do this, it is not recommended that I force some 91 into that, because they will become really weak, with all of their poor fibers broken by the stone wheels... I can search for an 85 looking so regular and almost smooth to become an 82, but an 85 will most likely become a 79. The final gauge is not something that can be forced, unless you will strengthen the string by applying some glue and varnish.

This is why I never recommend using varnished strings! You cannot know if they're polished more than what is strictly necessary to obtain a smooth surface!

On top of this, note that those strings that naturally came out of this process as smooth 82, are those that were false at their Mersenne's test at 88 and 85...

Smooth strings are never top quality strings:
they can either be good strings weakened by a hard polishing,
or slightly false strings polished until they become even.

Let me take this occasion also to explain why sometimes you have to wait for your strings more than expected. From the graphics below, you can see the results of the polishing process in number of strings gauge by gauge. It's a curve.



If I need more strings at the extreme gauges of this curve, I can try to change the number of strands to have them bigger or thinner. This is working well if we are speaking of big strings, from 160 on, made with 12-15 strands of gut. But when we have only 4 or 5 strands, most likely our curves will touch without really overlapping, so without solving our production problem. With so little quantity of strands in one only string, a strand thicker or thinner could make a difference causing the curves to conveniently overlap, or to not even touch. I will need to produce many strings of gauges not on order to make a small quantity of that precise gauge that was ordered.

Trying by changing the twisting angle is not a good idea as it will affect the sound.

A rough or slightly polished string offers the guarantee to be never forced into its gauge: it is a solid string, not weakened by the wheels, it is even and elastic. Its fibers are not so exposed at moisture as the ones brokered by the grinding machine, so it is more stable and longer-lasting. Due to the little empty spaces between one fiber and the other, it is more elastic and resonant, compared to a smooth one, and its sound is definitely richer. It's easier to play, less scratchy.

You may think that if the grinding machine gives so many problems, it would be better indeed to have hand-polished strings, or not to polish them at all!

I wouldn't recommend completely unpolished strings, because something like a grease bubble or a lump may result in a useless string while a little light polishing may render a wonderful string out of it, as normally these imperfections are like stacked outside of the string and rarely are inside (when they are, the string simply breaks at any attempt to polish it or use it).



Hand polishing may seem more gentle. It is, in the same way a hand saw is more gentle than a band saw, or a bench plane more gentle than an electric plane. But looking at the final result, polishing evenly a string by hand is really difficult, because you do not have any device to set the gauge you are trying to impose. A lump may cause you to press more just after it, creating a depression. A conical string will remain conical. A flat smooth string will have broken fibers as well as

a mechanically grinded one. The imperfections, even if smoother, will remain where they are. A grinding machine is way better because it will give you a cylindrical string leaving on the string maker the risk of throwing away strings which are too conical or have bigger imperfections.

If you really want perfect strings, which have been respected during the process and are touched by machine less as possible, or if hand polished are so even that the hand goes smoothly on the surface, without bumps, rendering a nice cylindrical string, a little rough, regularly rough, like velvet... the fundamental part of the process is not the polishing, is before. Be sure that the string maker is “scraping” the strings on the frame, when they are still partially wet, leather-like consistance, with a rough cloth with some horse tail hairs... this will flatten the surface, take out grease and lumps, and reduce the polishing work at a mere quality check.

This is how you can get strings which are durable, even, stable and easy to play, with a warm, open and colorful sound. Strings you will really enjoy!





Warning:

when you shift from a highly polished string to a roughly polished one, you need a bigger gauge. This because the string has some little empty spaces in between the strands, and most probably also because the hardly polished ones are often stiffer strings, less twisted, because this helps in the polishing process. So they are less elastic, they will stretch less compared with a medium or high twisted roughly polished string, and they lose less gauge while stretching. As an example, if you have a Varnished or smooth 66, you may order a 70 roughly polished to have the same feeling or tension...

Disclaimer:

I don't sell strings, I just love when people can play with joy.
And I dislike when we are victims of prejudices or tendentious advertising,
instead of being given the possibility to make our own informed stilistical choice.

This is not a case study and the examples,
though I believe pretty accurate, are only fruit of memories of my working days.

Thanks for reading this.
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