

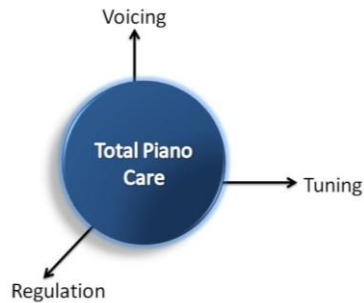


## Voicing

by Rob Mitchell

*"The most important thing is to transform the piano from a percussive instrument into a singing instrument."*

-- Vladimir Horowitz



Voicing completes the service trio for keeping your piano in top condition. In some ways, it's the subtlest of the three. But in other ways, listening to a high-quality, well voiced piano can just be amazing. To be effective, a piano must be thoroughly tuned and regulated first. While any piano can be voiced, it is certainly fair to say that the better the piano, the more to be gained from voicing.

Many people associate voicing with sticking needles in hammers. In fact, "voicing" includes anything done to the piano after tuning and regulation that improves the tonal evenness and power. Think of a rumpled blanket thrown on top of a bed -- voicing is the process of smoothing out all the bumps and dips.

Once more for emphasis: a piano must be well regulated and tuned before voicing should be done. If a pianist complains that a set of notes are too bright or too weak, then the first consideration should be: are these notes in tune and well regulated.

Voicing should start with an evaluation of the piano and the playing space, and a dialog with the pianist. Considerations would include the age of the piano (new hammer voicing is very different from voicing older pianos), acoustic condition of the room and the desires of the pianist for tone and power.

When technicians voice a piano, they are basically modifying the partials of each note. (The "partials" are the harmonics that every key generates.) People tend to think of a key as playing one note or frequency. But in reality, many frequencies are generated.

Continuing the conversation with the piano player, it's helpful to talk about emphasis of the high partials (giving a brighter, pop music sound) or lower partials (for a warmer, rounder sound). It's also helpful if the pianist can identify notes they already favor or those they don't care for -- notes that are too weak or too shrill.

First a short discussion of hammers and then on to the voicing process.

**Hammers.** Hammers are pretty amazing devices when you think about it. A hammer is a thick piece of layered felt (wool) that has been compressed and shaped around the wooden core, then glued and stapled to the core. The wool fibers are variously under tension or compression depending on location.

The hardness of the hammer must be "just right": too soft and very little sound is produced, too hard and the sound of the impact overwhelms the string vibrations. The folks that specialize in hammers talk about their "resiliency" which is just the right amount of "give" or springiness. And hammers don't last forever (in concert venues, the hammers are usually replaced every three years). Over time the resiliency degrades leaving a piano sounding lifeless

Quite a bit of attention is given to the selection and processing of the wool. Most of the hammer manufacturers have been in business for a very long time, and continue to experiment and make improvements. Under a microscope the wool fibers themselves have what would be described as "scales". As the wool is processed and packed, the scales of the fibers lock together. The needling process used by technicians unlocks these scales (among other things) and changes resiliency at different positions on the hammer.

The shape of the hammer is also important and will vary between manufacturers of pianos and hammers. The basic shapes are: pear, egg and diamond. Steinway is known for using a diamond shape hammer that has a slight point on the top. The other piano manufacturers most all tend towards the remaining pear or egg shapes.

**Preparation for Voicing.** Voicing starts by insuring that all is right with the bridges and that the strings are aligned with the hammers.

The bridges conduct the sound from the vibrating strings to the soundboard. The speaking length of the string should end at the bridge with the string resting on two points of contact in a 'v': one on the edge of the bridge and one on the metal bridge pin. A variety of problems can crop up here, but in the end it's important that the technician insure the pin is securely held in the bridge and string is seated in the 'v'.

At the other end of the speaking length, the trichords (notes with 3 strings in unison) should be level and matched to the hammer striking point so that they are all struck at the same time with equal force. This can involve a combination of pulling up on the strings for levelness and possibly some hammer shaping.

**Preliminary Hammer Filing.** Hammers are made from a single long piece of felt that is sliced after being attached to all the wooden moldings. Since this releases tension along the edge of the hammer, a slight cupping (indentation) occurs at the top of the hammer. New hammers need to be filed to remove this.

Older hammers will have string grooves from years of playing. The felt is compacted in the grooves and the groove "fingers" extending around the strings will dampen the sound. Hammers should be filed to almost completely remove any string grooves (and in older pianos, this alone can deliver a big improvement in the sound).

**Preliminary Hammer Needling - Tone Building.** When a technician needles (or "stitches") a hammer they are releasing tension in the wool. Depending on where on the hammer this is done will determine whether this brings up the power of a note or shifts the emphasis from the higher to the lower partials.

Based on feedback from the pianist, the technician will generally start in the octave below middle C and work down towards the bass. Particular attention is paid to the "bass break" where the transition from the treble to bass bridge occurs. Although it's generally not possible to completely smooth over this break, some improvements can be made. Power is usually lacking in the very low bass (octave 1), so the technician will work to bring this up.

The process then continues working up from middle C. More attention is always paid to the "killer octave"

in the area around octaves 5 and 6. Keys in this region are frequently either too shrill or lacking in sustain. The hammer needling finishes with the very high treble.

**Intermezzo.** After all this needling, it's common for the hammers to be puffed up and somewhat distorted from their original shape. The original shape will return through playing for a few weeks (or the process can be accelerated by filing the hammers).

It will also be necessary to again check the string to hammer mating and correct any new problems here.

**Final Voicing.** These are the "finishing touches". Again, it is helpful if the pianist can identify notes that they like and those that still need improvement. The emphasis though this phase is to even out tone and power such that no single note sticks out. No notes should sound shrill, even with a good firm blow to the key.

**The Results.** So what can the pianist expect? There will again be a short settling period as the hammer fibers lock into place and get packed down. Through this time, the instrument may start with a mellow sound but then trend towards the brighter side with power increasing. After this, the full benefit from the voicing should be apparent. All notes should be even in power with a rich and beautiful tone.

**Other Options.** Voicing a quality piano is always approached as preserving the original tone and integrity of the piano. So it's with a bit of dread when a customer talks about voicing an entire piano up or down (and more often than not, it's "down"). A common complaint is, "the piano is too loud -- what can we do about it?" I always encourage piano owners to work from the "outside in". That is, start with the pianos placement in the room while considering additional carpeting, window coverings, wall tapestries, furniture or plants. Sound-isolating caster cups are available if you're worried about the neighbors downstairs (though these are pricey). Next, acoustic foam can be added to the rear of uprights and underside of grands. To further reduce volume, hammer needling could give the last needed attenuation. But needling may be too subtle and steaming the hammers could be requested. Be warned that this is radical treatment that can cause a significant loss of tonal character (without starting over on the voicing process).

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