Practical Voicing

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PIANO PREPARATION

Characteristics of the Renner Premium Blue Hammer

The purpose of this write-up is to acquaint you with the Renner philosophy kof hammer design, as well as give you a basic voicing procedure that will produce consistent predictable results. A lot of care and work have gone into the design of the Premium Blue hammers top produce a hammer that is lightweight, made without any chemical hardening agents, and that will fit and produce desirable results on the pianos that American technicians work on.

- Resilient felt
- Product great carrying power
- Large volume with sonorous tone
- Durable and resist needle destruction

Tools Required

- A clamp that will hold 1/3 of the hammers for "gang style" filing.
- Sandpaper strips (80 and 120 grit)
- A 3-needle voicing tool for deep needling
- A "chopstick" voicing tool
- A stick hook
- Sandpaper strips (80 and 120 grit)
- A piece of 3/16" brass rod (or hammer shank)
- A small hammer.

Since even the best set of hammers can only bring out the sound, which is already in the piano, the bulk of the voicing job is actually done on the piano. No amount of needling or filing can compensate if this work is not done. While all regulation is important to tonal production, spacing the hammers to the strings and let-off are particularly important. The string terminations are also a major concern. The five jobs below account for maybe 60% of the voicing procedure. We recommend the following procedures in the following order:

1. **Lift all the strings.** Start about an inch out and pull up & towards the agraffes. Under the de Capo bar, lift & pull away from the keys, or massage from underneath and slide toward the front. You can tell if they have been lifted before by how much they come up
2. **Level the strings.** In the grand piano the action shifts, so acoustically it is important to make sure all three strings are struck at the same time. Therefore all three strings need to be level and the hammer needs to be straight. Use a string level. First put the level on the stretcher to see the orientation of the piano, then check the level of a few strings to know the angle of the piano. Start with the outside two strings until the bubble is in the middle. With the damper up, pluck the three strings to see that they are all equally muted. If the middle string rings, massage it up until the ring stops and the level remains. Place the level as close to the damper as possible, because you want the level right at the strike point or as close as possible. Ideally, do this before the dampers are put in.
3. **Seat the strings on the bridges** because the process of lifting the strings will actually raise them up in the treble. Now we want to settle the strings on top of the bridge in front of the front bridge pin and in back of the back bridge pin. Before seating the strings, the piano needs to be at pitch.
4. **Seat the front and rear duplex segments.** Lightly tap on the speaking length side of the duplex, and on the inner side of the V-bar and the front duplex bar. Tap on the hitch pins before doing the first pitch raise.
5. **Do a fine tuning.**

HAMMER PREPARATION

1. **File out the cups in the new hammers.** Before the hammers are hung on the piano, clamp them together and gang file them. Gang filing in the piano can vary because the shanks twist. Maintain the shape of the hammer.
2. **Hammer alignment.** The hammers should be centered under the three strings. The only exception is in the bass section where there should b e a little more hammer on the bass side. With the bass hammers slightly to the left, when the action shifts the bass hammers are still hitting both strings in the bi-chords.
3. **Fit the hammers to the strings.** Block the hammers up to the strings by placing a felt over the balanciers & under the knuckles. Since we know the strings are already level, now we can sand the center, the sides or some combination, use Joe Goss's rocking sanding tool. The other way is to use a sandpaper paddle and sand the sections needed. With the hammers blocked against the strings, pluck each string to hear if all three strings are touching the strings equally. By going through to make sure the hammers fit the strings properly, the piano will noticeably sound better.

HAMMER VOICING

With the pre-filing, pre-voicing (if you chose to do it), and piano preparation completed, you are now ready to do the hammer voicing. It is important in this process to ignore other aspects of the tone as much as is possible during this process. We would suggest that you check for the following in this order: The deluxe Renner voicing tool uses three #5 needles and is easy to push instead of needing to jab.

1. **Dynamic Range.** Most pianists like to play both loud and soft, so we don't want a piano that does just one or the other. Play sample notes ten times from pianissimo to fortissimo (very soft to very loud). Determine in your mind if the tone is good or doesn't grow any more. Are you able to play through the entire dynamic range without the sound distorting or breaking up? Deep needling in the shoulders from the 9:00 to 10:30 and 1:30 to 3:00 position will facilitate this. If you skipped the pre-needling previously, then the procedure described in that section should be performed now. If the pre-needling was not enough, then a few more stitches in the same area should help. When finished, you should be able to play with very loud blows, and the sound should remain clean and undistorted. Do not be concerned with the attack of the sound at this point. The attack may be too bright from soft to loud, or too mellow from soft to loud. The important thing to this point is can the note be played loud without the sound breaking up? If the answer is yes, then move on to the next step.
2. **Noise in Capo Section.** This is most noticeable in the first capo section. Play a note in this section, and then mute out the front duplex segment while playing. If there is an objectionable tone, which goes away when this front duplex segment is muted, then deep needling higher in the shoulder is required. Do not permanently mute this front duplex section, as this will cause a substantial loss of power. Deep needle from 10:30 to no higher than 11:30, and from 1:30 to no higher than 12:30, to the full extent of the needles. Always start low and work up. Be sure that the needles are aimed toward the two points to the side of the molding, thus preserving the triangle-shaped area under the crown in which we do not needle. We would suggest you proceed very carefully here, one stitch at a time, and do as little as possible, as too much needling in this area will reduce the power.
3. **Sustain.** This is also most noticeable in the first capo section. Does the note ring, like if you plucked the string, or does it die quickly? If it dies too quickly, the first thing to test is hammer fit to the strings. Block the hammer and pluck. Listen even more carefully than before to be sure not only that each string is damped, but that the sound, when each string is plucked, is exactly the same. Do any additional string leveling which is necessary now. If the tone still dies too quickly, shallow needling on the keyboard side of the hammer along the edges will help. This is easily performed with the action in the piano by using the "chopsticks" voicing tool. To voice along the edges, play the note such that the hammer tail is in contact with the backcheck. While holding your finger on the key, place the chopstick voicing tool in contact with hammer low in the shoulder, where an additional poke will have no effect, and push the hammer down into the backcheck. With the hammer held in place, you can now needle along the left and right edges of the hammer, from 9:00 to 12:00. Listen to hear if the sustain has improved. If the tone still dies too quickly, shallow needling from 10:30 to 11:30 may help. Check to make sure the string rings when plucked. If not, then you may have a problem with soundboard crown or down bearing. You may also want to shift the action position fore and aft to see if the strike point is in the correct position.

4. **Metallic Sound.** Play each note. If a metallic sound is heard, check to see which string(s) the sound is coming from. Once these strings are isolated, use the chopstick voicing tool to do shallow needling at the crown right under the offending string(s). These metallic sounds can also be the cause of the offensive sound in the front duplex segments.
5. **Attack.** The attack is controlled by the very striking surface of the hammer. If the attack is too bright, then very light needling at or just under the crown will soften the striking surface and reduce the attack. This can be easily performed in the piano with the chopstick voicing tool. If the attack is too dull, then the striking surface must be made harder. You can first try ironing with the flat iron over the crown to see if this made the surface hard enough, and the attack bright enough. If not, then on a few sample hammers, try filling a few more layers away, maintaining the original shape, thus getting down to where the felt is more compact and hard. After filing, you must again test to be sure that the hammer fikt to strings is perfect. This time if it is not, it is because the individually filed hammer is not perfectly square. Use sandpaper file to fit the hammer to the strings. You may want to iron again, after filing, for cosmetics as well as sound. It is important to remember that the sound will get brighter in the first 50 to 100 hours of playing, and try to anticipate this.
6. **Eveness.** When the piano is played chromatically in sixteenth notes, our ears naturally want to hear the first of each group of four notes as the loudest. If when you play, you hear a note other than the first of the group as loudest, or you hear the first note as if it were accented, then the attack of this note must be brought back to match its neighbors. This is accomplished by ;uysing the chopstick voicing tool with the action in the piano. Begin with shallow needling at or just under the crown, a little at a time. This is easily overdone, so proceed slowly. Play up and down the keyboard and make the attack as even as possible, playing with medium pressure. Set the string groups. If you have one string that is a little dull, mute the other strings and hit the hammer to force the grooves in to bring the tone up by compressing the hammer a little.
7. **Balance.** When the piano is played, it is important that the chord combinations have the proper balance of each note in the chord. Any note that sticks out will distract from the beauty of the music. Voicing chords in this way will create the proper balance from section to section. We recommend using a four-note chord to test this. For example, in the key of C the notes would be C3, G3, E4, and C5. This chord is then transposed chromatically up and down the keyboard. If any note seems to stick out, stop immediately, fix it with the chopstick voicing tool, then immediately re-test. This is the only way you can really know if you have solved the problem. As you can see from the previous example, note C5 has to fit as the fourth note of the series in this case. A few notes later, it will have to fit as the third note of the series, then as the second note of the series, and finally the bottom note. When every note can fit in any position in the chord, the proper balance has been achieved. In testing the bass, I use just three notes for clarity. In the key of C, these would be C3, G2, and C2. Each note must fit as the top note, middle note, and bottom note. When you have completed this step, repeat step 6 to refine the evenness from note to note.
8. **Shift Position.** The next step is to check for evenness with the left pedal engage, and the action in the shift position. The procedure is the same as in step 6. It is even more crucial here to isolate the offending string(s), and work with the chopstick voicing tool directly under these strings, at or just under the strike point. It is important to be certain that the action shifts far enough to completely clear the left string. If the hammer still fully or partly contacts this left string, it will create an objectionable sound that can only be eliminated by correcting this problem. Care must be taken when voicing in the shift position that correcting problems in this position does not create problems in the rest position. This is why it is so crucial to work carefully only under the offending strings. When finished, repeat step 6 again in the rest position.
9. **Final Test.** As the final test, play octaves up and down the keyboard, listening to hear if any stand out. If so, it is usually one of the two notes that is louder than its neighbors. Correct the problem as in step 6. When you've finished, the piano should play evenly from note to note, and be balanced from section to section. This is your assurance that when music is played on the instrument that the sound will be pleasant.