C. BECHSTEIN

Voicing



Voicing

1 What is Voicing?

Voicing forms the tone of an instrument.

For each nuance of touch, the voicer can influence the resulting volume and colour of sound.

The quality of the instrument‘s acoustic structure, high grade material and workmanship of the hammerhead and a well-designed and regulated keyboard and action assembly are important pre-requisites.

As the name pianoforte implies, the instrument can be played quietly (softly) as well as loud. The more nuances of volume can be achieved and controlled by the pianist, the better. Volume is not the only dimension the pianist needs to create tension, to emphasize melody lines. Each dynamic level of an intricate instrument has its own tone colour. The more nuances of tone colour the pianist has at hand, the better he can convert his musical ideas into sound.

This dynamic development must be consistent for all 88 notes of the instrument, i.e., for all keys the same touch will lead to the same volume and matching tone colour. The “vertical” dynamic development must be balanced „horizontally“ for all 88 keys in each of numerous dynamic levels.

In the C. Bechstein Technicians Academy technicians have the opportunity to understand and learn this intricate artistry of creating tone, simply called voicing. It is evident that voicing cannot be learned easily and within a short span of time. Acquiring this skill requires, in addition to a good ear, also endurance, focus and painstaking accuracy..

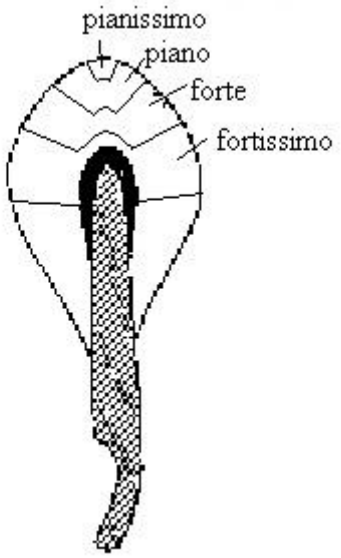
2 Preliminaries

Before starting to voice, one should examine the condition of the instrument. The keyboard and action assembly must be well regulated, hammerheads exactly spaced and fit to the strings and all strings levelled. Precise let-off, after-touch, perfect function of dampers and damper touch are prerequisites for even touch. Only after all functions and settings are precisely adjusted and set, is it possible to assess the hammerheads and their properties; only then can the voicing procedure required be defined or decided upon..

3 Objectives

When you install a new set of hammers, you should have a clear objective or vision of the sound you wish to achieve on that particular piano. Towards this goal you first need to evaluate:

1. Which possibilities and potential offers the set of hammers?
2. How can it best be integrated with the specific sound body of that particular piano?
3. How can the potential inherent in the tonal-body be brought forth in full diversification of tonal development? Put simply: how can you maximize on both, potential of sound body and potential of the set of hammers at hand?



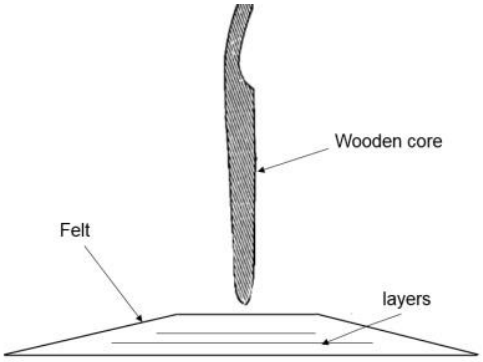
For the above evaluation, the following aspects, i.e. criteria are essential:

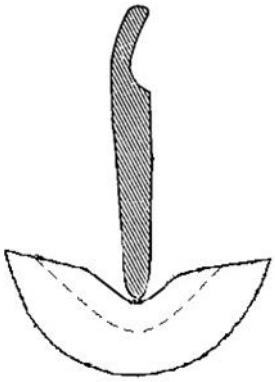
- **Dynamics:** the variations of tonal dynamic possibilities of the tone under differentiated intensity of touch, from pianissimo or very soft touch and up to fortissimo or very loud sound.
- **Length of tone:** the tone ought to be possibly long in its duration, nonetheless not endless. The tone should not end abruptly but gradually, it should continue to be full-bodied, clear and transparent and of course free (unimpaired).
- **Tone color:** when using an energetic or powerful touch, the tone should gain in its brilliance or clarity as well as in volume at each dynamic gradation, and you should be able to modulate the tone dynamically as you proceed in the dynamic scale.
- **When playing loud or forte**, the tone colour ideally opens and unfolds. This can normally be achieved with resilient hammerheads, made of the best felts and suitably pressed by the hammerhead maker. This means that the pianissimo section of the hammerhead can freely move like a spring on top of the hammerhead core apex.

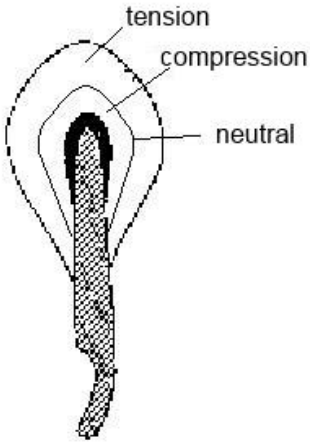
4 Dynamic Zones of the Hammerhead

The hammerhead consists of felted sheep wool processed in various stages, then formed into special pads, then pressed around a wooden core (a walnut core in C. Bechstein instruments) and glued. Coloured felt at the top of the wooden core, so called underfelt, serves as cushion for the white hammerhead felt. It is obvious that the tension implied in pressing the felt around the wood, remains in the hammerhead. Tension (traction) in the outer fibers contrasts with compression in the inner fibers.

Voicing

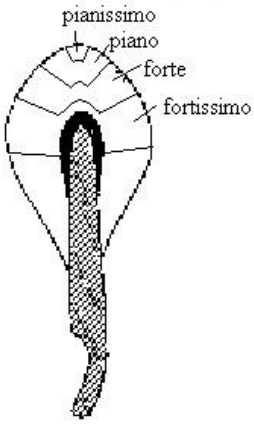




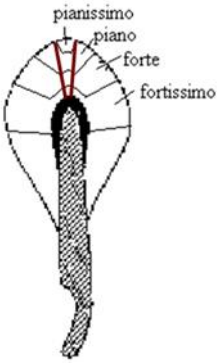


The voicer can work with this tension, and build structures of different tension and mass within the hammerhead. The main goal remains to relocate the tension in a way that with each dynamic level the tone gains more colour and volume.

We use a model serving to understand how different areas within the hammerhead function. The idea is to define areas within the hammerhead that are activated in the respective dynamic level. These areas are also needled accordingly when the hammer is built up and also define how deep we needle in the respective area.



1. Pianissimo (pp) zone --> light hammer impact (essential for tone colour. This area should neither be hard nor too soft) - maximum needling depth 1-2 mm.
2. Piano zone - maximum needling depth 2-3 mm
3. Forte zone - maximum needling depth 4-5 mm
4. Fortissimo zone --> powerful hammer impact - maximum needling depth 6-7 mm

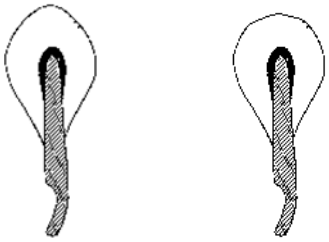


particular significance of the piano zone:

Selective and careful needling in the crown of the hammer has an effect on all dynamic levels. As indicated in the picture at right, a wedge-like area from the pianissimo zone to the peak of the wooden core (marked red) touches all dynamic zones.

Please note: this part of the hammer should only be needled by experienced technicians in order to avoid significant damage.

5 Hammerhead Form

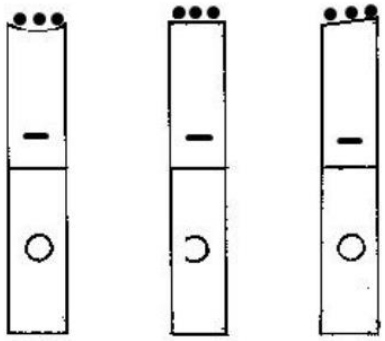


A hammerhead with a pointed crown generally favors higher partials and creates a brighter tone, whereas one with a more rounded crown favors fundamentals, thus creates a warmer tone. The form must match the tonal intention of the instrument's design. When sanding the hammerhead, the intended form should be achieved again. Never form a pointed, egg-shaped hammerhead (at left) into a round one (at right).

A round form can also develop with deep needling. This indicates that after intensive needling one should always sand and correct the form again. Generally try to sand off as little felt as possible. The outer fibers with high tension are essential for a good tone. The more felt we send away, the more we reach the compressed area and thereby end up with less dynamic range.

6 Adjusting Hammers to Strings

As mentioned earlier, all strings must be on one level. The hammer must hit all strings at a 90° angle. If one string protrudes a little, the hammer will mainly hit this string with more impact than the others. This leads to a thinner and „whistling" tone. The crown of the hammer must also be adjusted to the strings in order to hit all three strings equally..



Middle string open | OK | Left string open

7 Stages of voicing

The process of voicing is divided in four stages:

- pre-needling
- first voicing
- second voicing
- final quality control

Before gluing the hammerheads we needle the hammerheads and then sand them gently. By needling the areas described before as dynamic zones, we build up the hammer structure and create dynamic zones.

After the first regulation of the keyboard and action assembly, the first voicing follows and starts with levelling all strings. Each set of hammerheads is individually treated matching the respective instrument. The main task of the first voicer is to define the dynamic range and dynamic development of the instruments and the tone colour of each dynamic level.

After first voicing the instrument will be played in order to stabilize the touch as well as the tone. In the final stages of manufacturing the instrument, after a further refined regulation of the keyboard and action assembly, the chief voicer refines the voicing of the instrument once more and balances it. During the final quality control, a concert technician checks all aspects of the instrument and plays it to assess its musical qualities and correct whatever might be necessary.

8 Single String Voicing

It is mandatory that the hammer hits all three strings simultaneously and with the same impact and that the tone of all three strings is the same. If only one string sounds different than the other two, due to the hammerhead being either harder or softer, this can be heard immediately.

Thus each string must be checked and balanced meticulously. Single string voicing allows us to detect areas in the hammerheads that need to be balanced as to density (especially of the crown) as well as hammerheads that do not hit all three strings with the same impact..

9 Shift Pedal

In a grand piano the shift pedal moves the entire keyboard and action assembly to the right. The pianist can thus continuously vary the tone of the instrument until the hammer hits only two of the three strings. With the shift pedal different areas of the hammers hit the strings enabling the voicer to modify the tone of the shift pedal separately.

With the shift pedal, the instrument will sound a little softer, allowing further colours of sound, however, the sound with shift pedal should never be muffled or dull.

Also with the shift pedal all dynamic levels must be balanced by the voicer.

10 Stabilizing the Hammer

The voicer can also stabilize or harden the hammerhead in various areas to reach more power or brightness. This can be achieved with compressing the hammer, e.g. by ironing with a hot iron or by inserting stabilizing liquid that increases tension or density.

Subsequently the hammers need to be balanced again, including with shift pedal.

11 Voicing as Part of the Service

After playing the instrument for some time, the strings leave marks on the hammerhead and the hammerhead felt compresses, where it hits the strings. It is thus necessary to voice the instrument regularly. Naturally not all keys are played equally, thus also voicing will become unbalanced with time and then needs correction.

Climatic influences can also change the sound of an instrument. In humid ambience, the hammer felt absorbs moisture and in dry climate the hammer felt will give off moisture. This will eventually also change the sound of the instrument and may have to be corrected through voicing.