



*Photo 439: At last, I'm ready to turn my attention to the keys. Apart from trimming the keysticks on the table saw in preparation for new molded keytops, and burying the entire set of keys for weeks in baking soda to eliminate mouse odor, they have not been touched. Obviously, from the looks of them.*



*Photo 440: The set of keys, in this photo minus the sharps, are always kept in order during the processes involved.*



*Photo 441: The first order of business concerns the brass capstans at the back of each keystick. These are especially important in that they serve as the point of contact between the key and the lower part of the action.*



*Photo 442: The effects of time on brass are seen clearly in this photo. The problem with this is that the upper surface of the capstan should be slippery smooth to eliminate friction. These capstans will in short order be polished to a mirror finish.*



*Photo 443: For the time being, the complete set of capstans are removed by backing them out with a regulating tool. They will be set aside and returned to the key after several intervening steps have been accomplished.*



*Photo 444: Without the capstans in place, the riser at the backs of the keysticks may now be sanded to eliminate the final reminders of the mouse colony.*



*Photo 445: A small sander equipped with 150 grit paper, followed by 220 grit, does the job nicely.*



*Photo 446: Things are already starting to look better.*



*Photo 447: With the keys clamped firmly in place on the bench, the area of the keysticks in between the key buttons and the back riser are initially prepped with an inline pneumatic sander.*



*Photo 448: To eliminate side-to-side sanding marks left by the air tool, each section is hand sanded with grades progressing down to 600 grit paper.*



*Photo 449: The set of keysticks with top surfaces sanded. Remaining staining on the sides of the keysticks will be dealt with in a later stage.*



*Photo 450: Old key bushings are now removed. The first step is to dampen the old felt with wedges of hammer felt.*



*Photo 451: If the old bushing felt does not readily come out after moistening, an electric key bushing removal tool is inserted into the mortise to further loosen the glue holding the felt in place.*



*Photo 452: In a few cases, reluctant bushings must be scrapped away with a small chisel.*



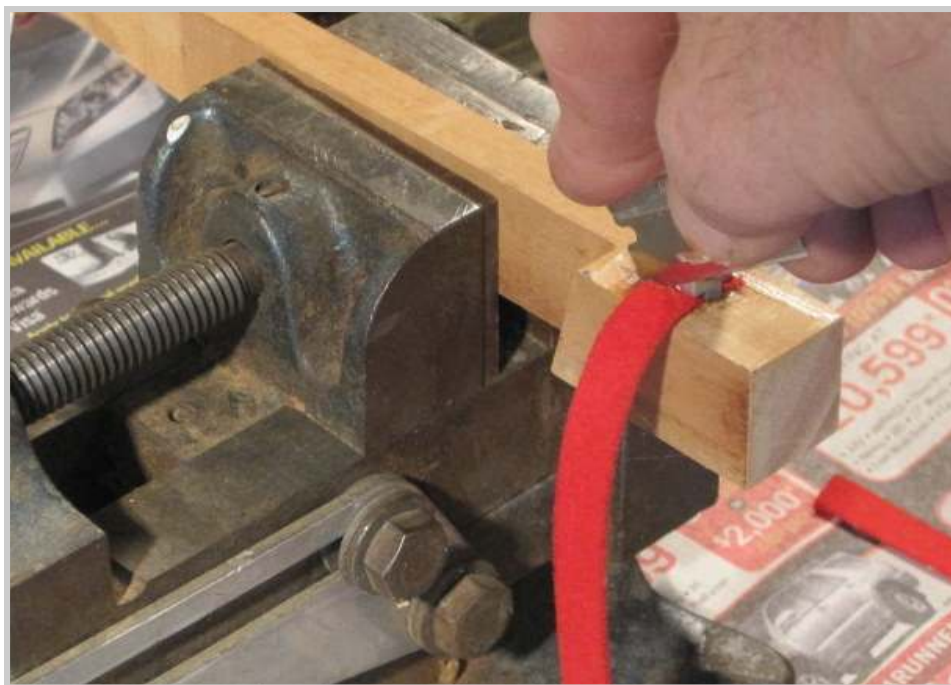
*Photo 453: The key buttons, without bushings, having now been dried out over-night. The mortise for the front rail bushings have also been cleaned of the old felt and allowed to dry.*



*Photo 454: Hot hide glue is again the glue of choice. Aluminum bushing cauls are heated on the side of the glue pot in readiness for insertion.*



*Photo 455: The proper thickness of felt and the proper caul size have been selected. Hot glue is applied to the inside of the mortises, and the correct length of felt inserted. The heated caul is then pushed into place.*



*Photo 456: With the caul inserted all the way, the sides of the felt are trimmed.*



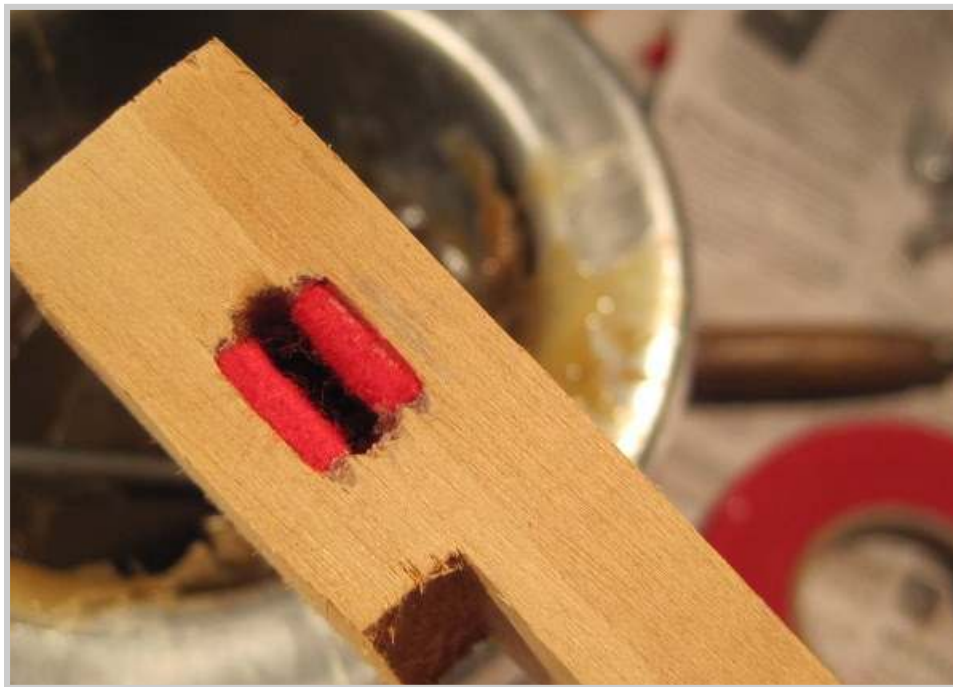
*Photo 457: Once the caul is inserted and the bushing felt is trimmed, the key is placed in the vise for a short time to insure that the felt adheres to the shoulder of the mortise.*



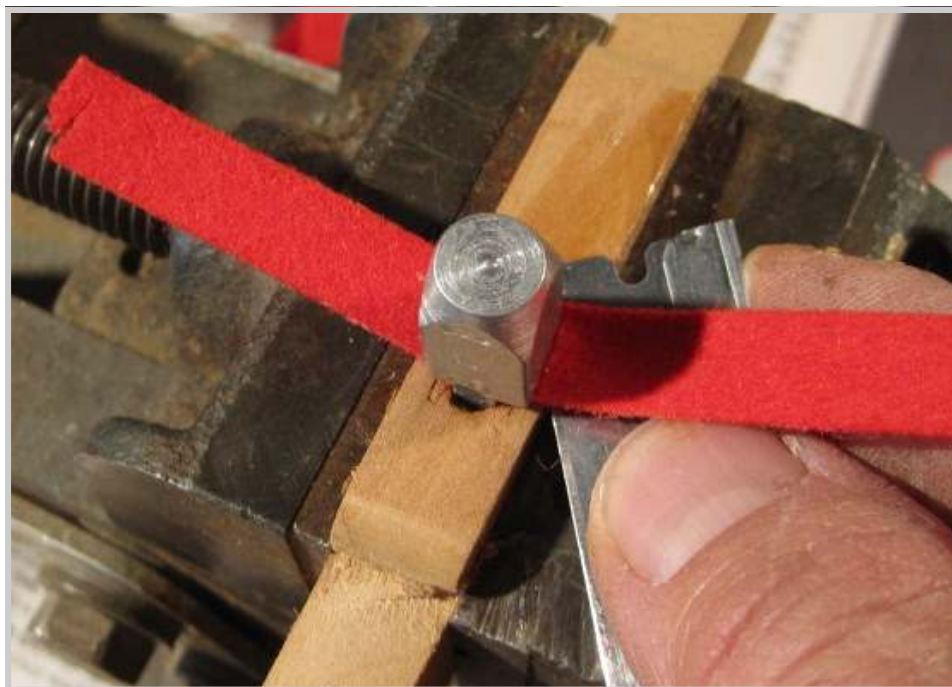
*Photo 458: The wooden block on the left keeps the caul at a 90 degree angle.*



*Photo 459: Once the glue has been allowed to cure, the bottoms of the keys, and the tops of the key buttons, are sanded to remove any wayward glue.*



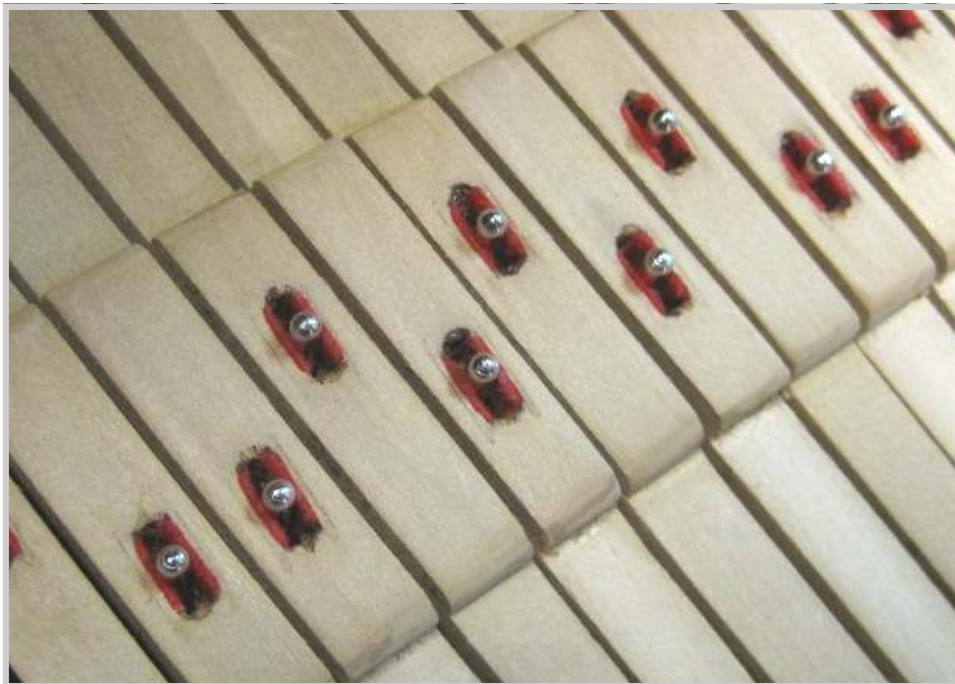
*Photo 460: A finished front bushing. A gentle easing is the only step remaining.*



*Photo 461: Balance rail bushings are trimmed flush with the top of the key buttons. Once the caul is inserted all the way, it is pulled slightly out of the mortise so that the razor can slice the felt flush.*



*Photo 462: With the cauls for the balance rail bushings in place, the keysticks are placed in the holder for the hide glue to cure.*



*Photo 463: Key buttons with new balance rail bushings installed.*



*Photo 464: Work progresses from left to right. Keys on the left have new bushings installed. Missing keys in the center are being worked on. Keys on right are waiting their turn.*



*Photo 465: A pile of capstans, ready to be polished.*



*Photo 466: The buffing wheel is loaded with Red Tripoli polish.*



*Photo 467: With the wheel turning at its lowest speed, the head of each capstan is polished. The effects of nearly a century of exposure to the air melt away.*



*Photo 468: The wings of the capstan are cleaned on a micro wire wheel used on a Dremel tool. Again, the speed of the wheel is set on the lowest possible setting*



*Photo 469: The capstan thus cleaned is ready to be replaced into the riser at the back of the keystick.*



*Photo 470: Smile for the camera! Polished brass is truly beautiful.*



*Photo 471: Recovering the naturals is the next step. Opinion is divided over the best adhesive to use. My glue of choice is contact cement. I coat the wood, let it dry, then coat it a second time.*



*Photo 472: A section of keys with a second coat of contact cement applied dry for approximately 30 minutes, or until tacky to the touch.*



*Photo 473: Coating the inside of the molded keytops is the only tricky part in the process. The glue must not be allowed to touch the playing surface of the keytop.*



*Photo 474: Molded keytops with fronts are placed in order on a drying rack to dry until tacky to the touch.*



*Photo 475: The keystick and keytop are carefully joined together by folding the keytop down over the wooden keystick.*



*Photo 476: The bond between the two components of the key is formed immediately upon contact. Any adjustment at this point is very difficult. Each key is clamped down in a vise with cork facings for a few moments to strengthen the bond.*



*Photo 477: The overlong front of the key is ground down on a grindstone set at a slow rotational rate.*



*Photo 478: The keys are placed back on the keyframe to mark for the notching around the sharps. The thickness of a dime should be allowed for clearance between the front of the sharp and the notch in the natural keytop.*



*Photo 479: Clamps are used to hold a straightedge in position.*



*Photo 480: With the straightedge clamped down on either side of the keybed, the keys are pushed up from underneath against the ruler firmly with the fingers of one hand, while a sharp scratch awl is used with the other hand to scribe the keys for notching. Care is taken only to scribe the portion of each key actually to be notched.*



*Photo 481: The first cut for the notches are made with a coarse file used on edge. The cut is stopped just short of the line.*



*Photo 482: The notch is finished with a fine file, using the wide, flat side of the file to carefully cut out the rest of the unneeded material. A perfect 90 degree cut-out is the goal.*



*Photo 483: Using first the coarse file, and then the fine one, each key is filed flush with the keystick on either side.*



*Photo 484: The corners of the overhang of each key are given a slight curve, and the sides of the keytop are slightly rounded to give softer edges which are easier on the fingers of the pianist.*



*Photo 485: A completed keytop. The final optional step of buffing with 0000 steel wool gives it a texture more like ivory, less slippery than plastic.*



*Photo 486: An unfinished sharp. These sharps are made from ebony wood which was painted originally with a black lacquer. The ebony itself is a beautiful wood, and oftentimes looks more attractive without an opaque coating. Again, there are optional approaches to the refinishing of the sharps.*



*Photo 487: Removing the old lacquer is the first step, no matter what course of action is taken in refinishing the sharps. Here, a thick coat of stripper is applied.*



*Photo 488: After a heavy coating of stripper is applied, the sharps are hung upside down in a rack. This prevents the stripper from running down to the bottom of the keystick and contaminating the new bushing cloth.*



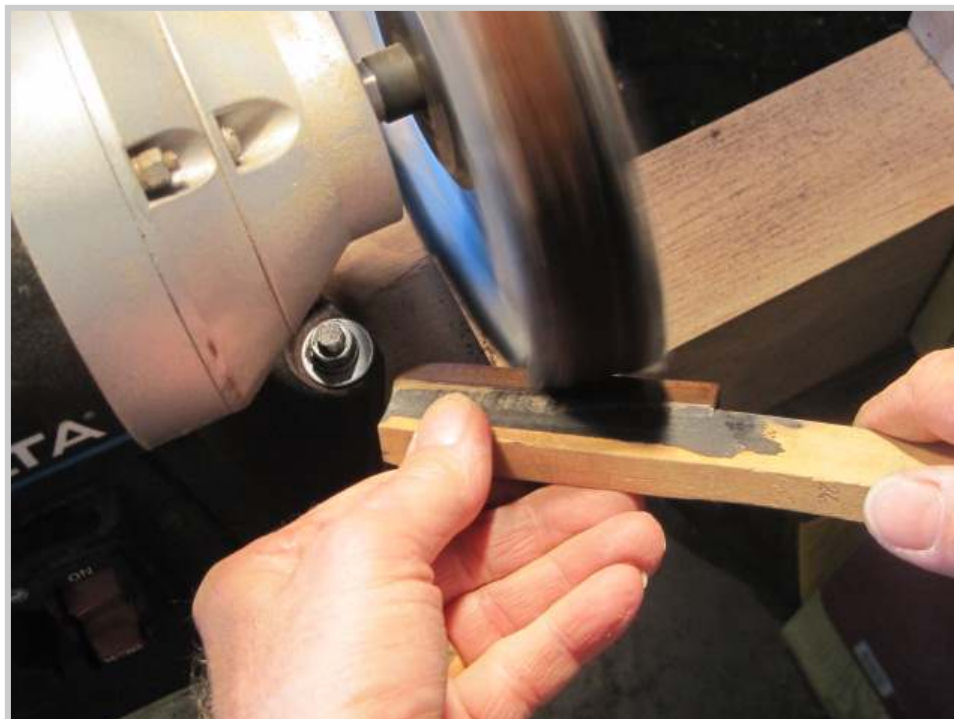
*Photo 489: Once the lacquer has been softened by the stripper it is scrubbed with #3 steel wool. If a second treatment seems necessary, more stripper is brushed on and the key is returned to the rack for a short time.*



*Photo 490: When all the old finish is removed, the sharp is cleaned off first with a dry paper towel.*



*Photo 491: Final cleaning is done with a paper towel dowsed in lacquer thinner. The sharp is then allowed to dry.*



*Photo 492: The customer in this case opted for a natural appearance given to the ebony with a simple polishing on the buffing wheel. Red Tripoli bar polish, as opposed to a ebony bar polish, was used to bring out a reddish glow to the sharps which coordinated with the finish of the case.*



*Photo 493: A finished sharp key. Sharp indeed!*



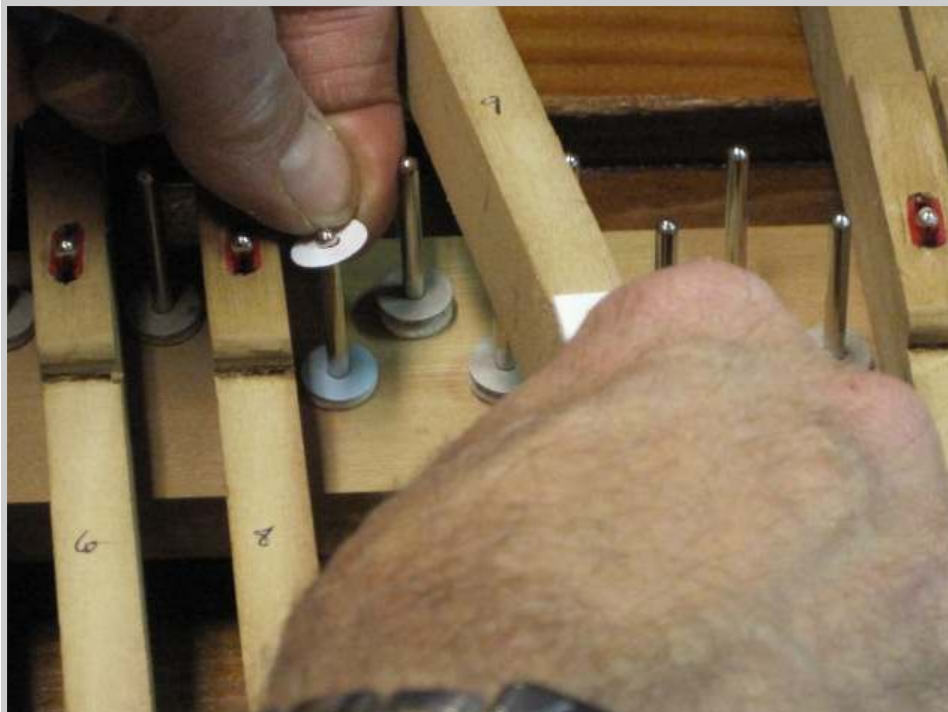
*Photo 440: As the naturals and sharps are completed, they are returned a final time to the keyframe to be leveled.*



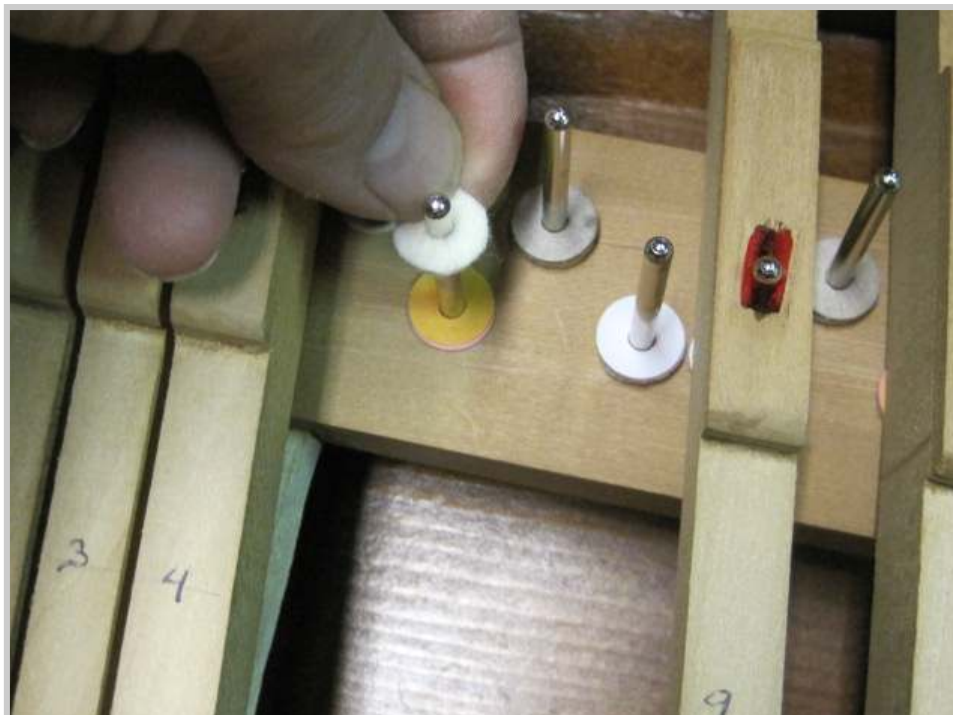
*Photo 495: With a key leveling device, the naturals are brought up to the level of the highest key. Leveling papers as fine as .001" are used to produce a perfectly level set of keys.*



*Photo 496: The sharp keys are leveled 1/2" above the naturals.*



*Photo 497: Color coded paper punchings are inserted on the balance rail pin to build the height of keys which are initially too low.*



*Photo 498: Once the keys are leveled, the felt balance rail punchings are flipped back on top, with the leveling papers underneath.*



*Ahh!*

The keyboard is now complete. To appreciate the work that has been done, compare this picture with photo 4 of Photo Set #1. Work on the action nears completion as well. New dampers need to be installed and adjusted, and the action must be regulated. The case needs to be given a final buffing and polishing, and must be reassembled. Finally, the piano will be tuned a minimum of four times before it leaves the shop. The deadline for pick-up approaches, and I must keep at it. This is the part of the job I love the most, however, so I'm enjoying every minute.