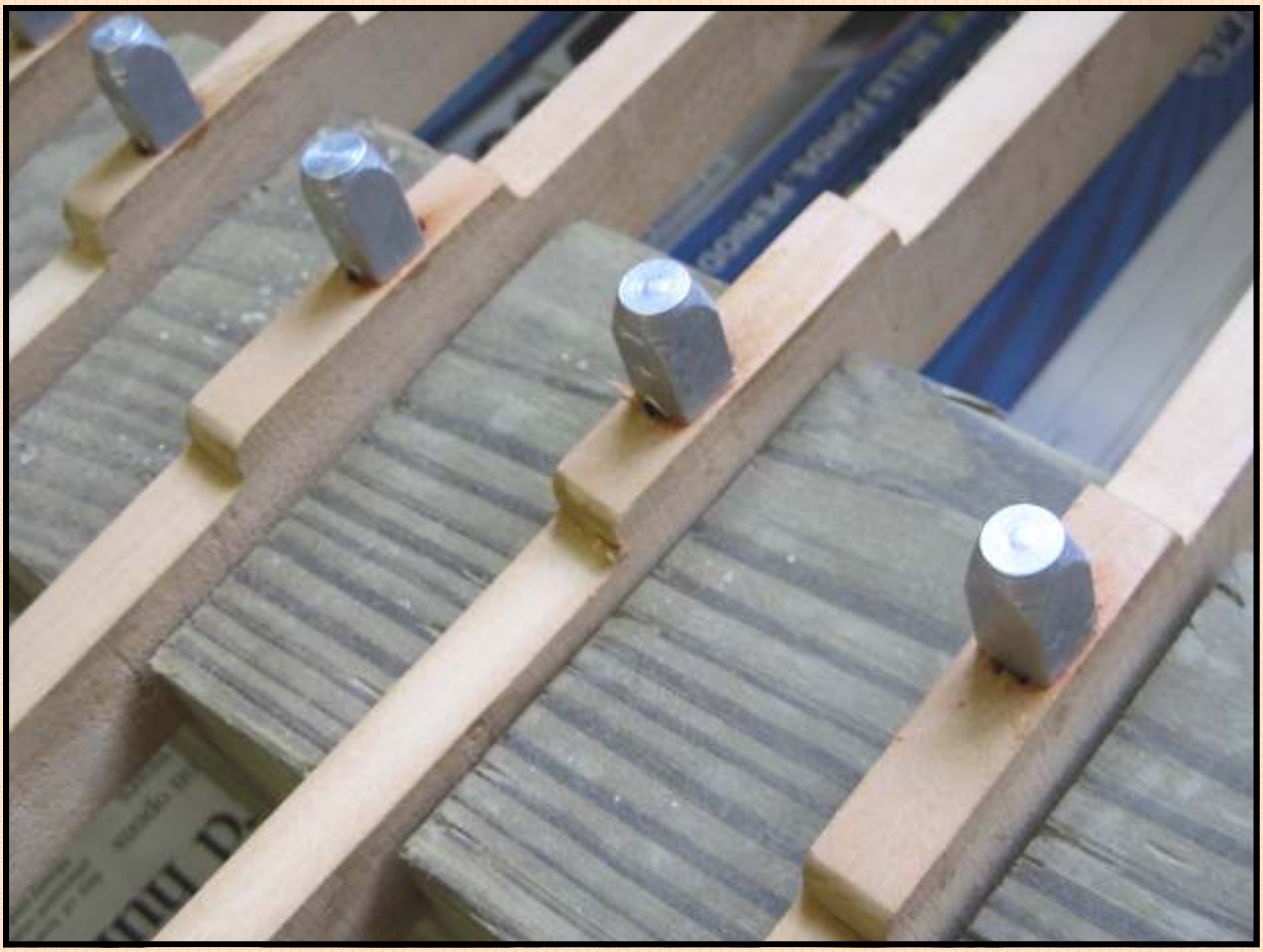
Schaff Piano Supply Company Presents:

Rebushing Keys

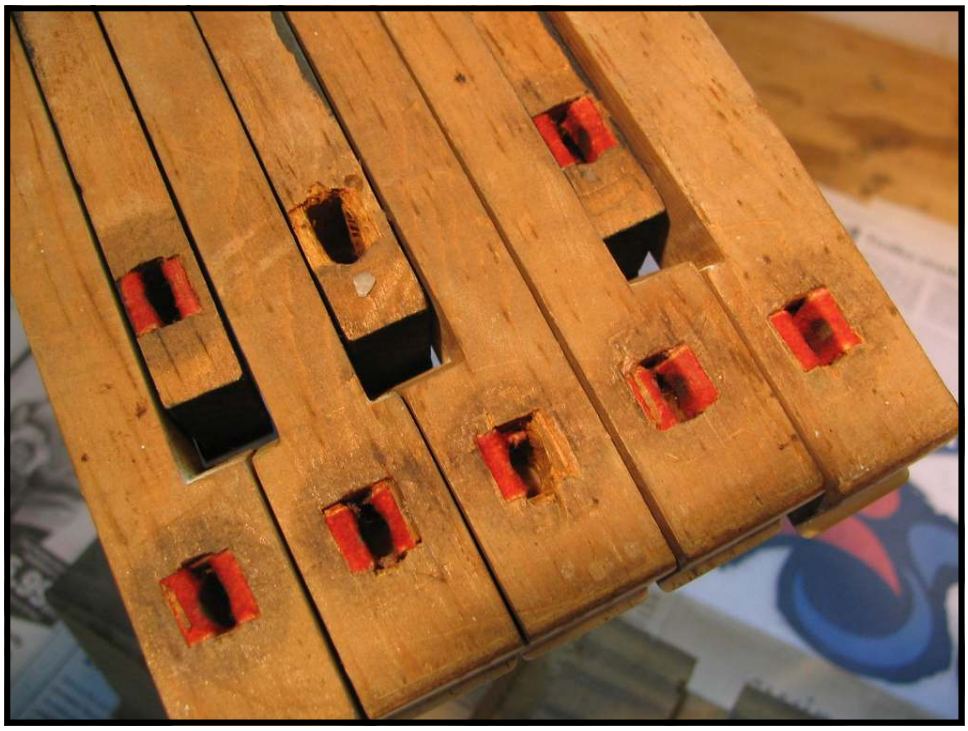
Basic Step-by-Step Procedures



Key Work

By Chuck Behm

Rebushing Keys



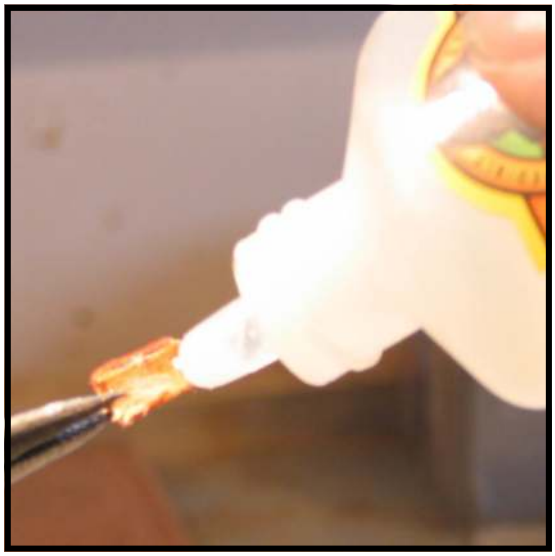
-Rationale-

Wobbly keys are an indication that a rebushing job is in order. When the bushings in a piano's keys begin to harden, or drop out of the mortises altogether, the resulting back and forth play of the keys makes for a very sloppy feel. Removing the old bushing felts, and replacing them with new felt firms up the keys as they travel up and down, and gives the piano much more of a new feel.

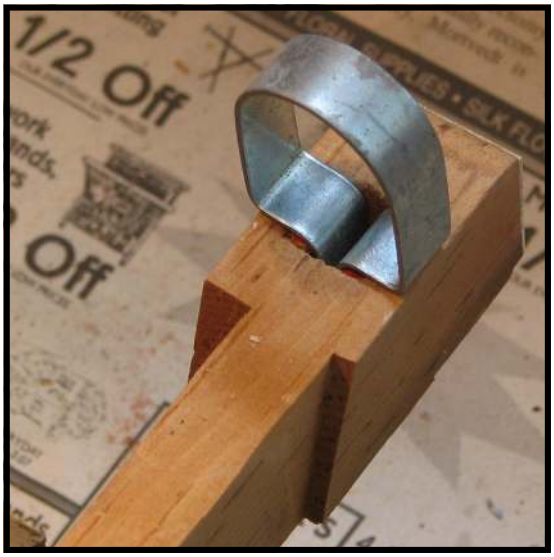
This is a job which is best done in the shop, in that it is rather time-consuming. If the piano is in the shop already for other repairs, that is the ideal time to complete such work. If the piano is in a customer's home, the keys, or better yet the keyframe along with the keys, may be removed from the piano and transported to the technician's shop for proper repair.

Following are step-by-step procedures which may be used in a complete rebushing of the front and center rail mortises of a set of keys.

Step 1: If the rebushing procedure is intended to be your day's work, get your electric glue pot (Cat. No. G-1155) going now. Mix water and dry cabinet glue (Cat. No. 399-1/2) at a ratio of approximately 1 part water to 1 part glue crystals. For rebushing, you will want the glue neither too thick or too thin. You can adjust the consistency later by adding more crystals or more water. Once the glue is melted, put the temperature control on the "standby" setting until ready for use.



Step 2: Before beginning to do the rebushing job, check to see if there are any bushings falling (or fallen) out with wood attached, as is commonly the case. If there are, and the location from where the bushing came from is definite, use a waterproof glue (such as Gorilla White glue) to reattach the felt and wood to its original position. (If felts have fallen out with no wood attach, simply discard.)

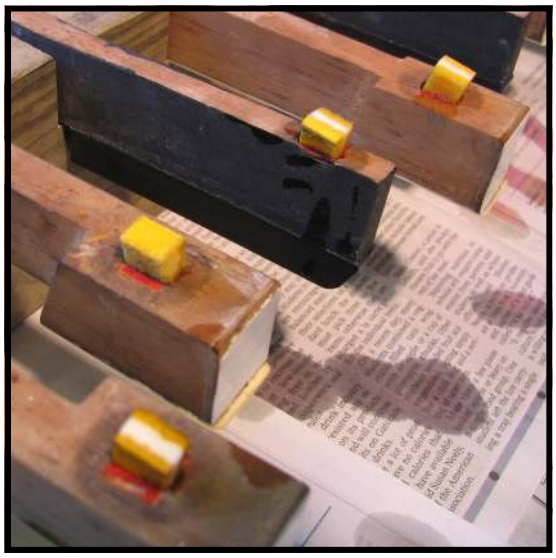


Step 3: Use a key bushing wedge clamp (Cat. No. 151) to clamp felt and wood into place. Let dry for at least an hour before proceeding with further steps. These clamps are satisfactory for preparatory work such as this, or for "on-the-spot" repair out in the field for missing bushings, but are not really well suited to do an entire rebushing job.

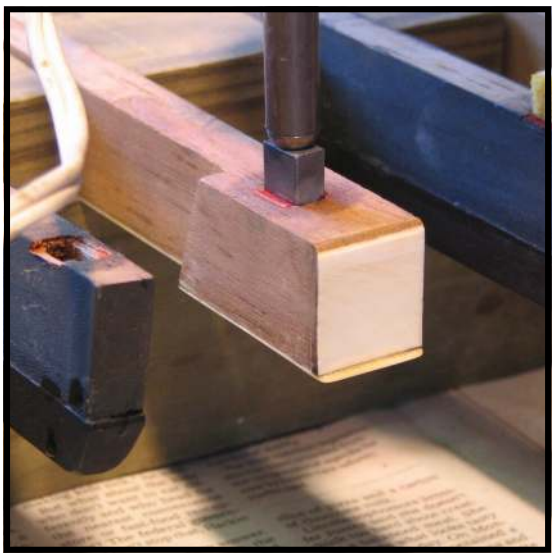
Step 4: Beginning on the bass end of the scale, put the first set of keys to be worked on in a keystick holder. (This is a very easy item to make, by the way, and most useful for this type of work—simply a 4” x 4” slotted at regular intervals with a dado cutter on a table saw. It also is a perfect holder to use when lacquering sharps.)

Step 5: Put a batch of felt wedges in water to soak. These are easily made from old hammer head felts. Remove the felt from several old hammers from the wooden molding, and cut the tips off of the tapered ends. If you don’t have old hammers available, hammer felt trimmings (Cat. No. 303) are available, and work perfectly for the purpose. When the wedges begin to sink or fall to the bottom of the container, they are ready to use.

Step 6: In anticipation of stubborn bushings, plug the Jaras electric key bushing cloth remover, (Cat. No. 909) into your heat control unit (Cat. No. 906), and turn on. Experiment with the settings to find what temperature works best for you. My own tool seems to work best on a setting of 7. As you use the bushing cloth remover, remember to prop the heated end up with a non-combustible holder. It does get very hot, so always turn it off when you are away from the bench.

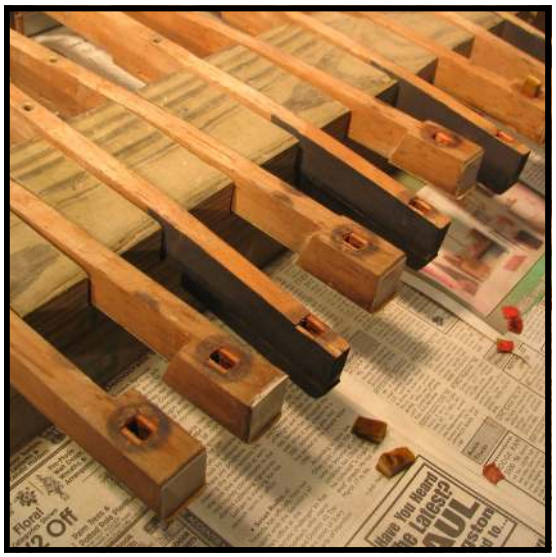


Step 7: Insert felt wedges that have been soaked in water into the front rail mortises for the keys that have been placed in the keystick holder. Allow ten minutes or more for the water to be absorbed by the bushings. (For some bushings, this treatment alone is enough to loosen the felts to the point where they may be easily removed—sometimes in fact they will simply fall out at this point.) In the case of bushings which do not come out readily, proceed to step 8.



Step 8: For bushings that do not easily come out, insert the heated end of the key bushing cloth remover into the mortise, and count off between five to 10 seconds before removing. (Too long of a wait will turn the water to steam, and will reharden the glue.)

Step 9: When the key bushing cloth remover is pulled from the mortise, some bushings will adhere to the heated tip and should be brushed off. Others will remain inside the mortise but will be loosened to the point where they will pull out with a pair of needle nose pliers (Cat. No. 239). If the bushing still seems to adhere, don't force the issue, or you will most likely remove wood as well. Instead, remoisten the old bushing with a saturated felt wedge, and try the procedure over again.



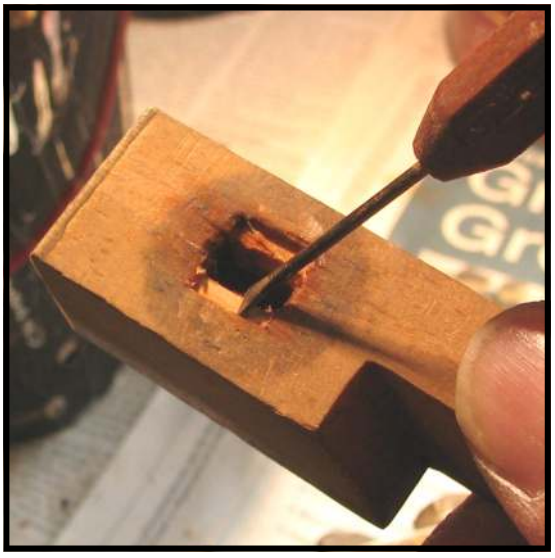
Step 10: Once a handful of keys have been stripped of their front rail bushings, the process of putting in new bushing felt may begin. By having a group of keys in each stage of the process on the keystick holder at one time, the operation may be done in an efficient manner. At this time, turn your glue pot up to operating temperature of 160 degrees.

Step 11: With an accurate micrometer, such as the Starrett micrometer (Cat. No. 3338) or the Starrett digital micrometer (Cat. No. 4044), measure the thickness of the original bushing cloth. When measuring felt such as this, employ a light touch as you turn the thimble so as to not compress the felt between the spindle and anvil of the micrometer and give too small of a reading.

Step 12: From the available thickness of bushing cloth, pick the closest match to the original felt. Key bushing cloth is available in 2 quality levels, each of which comes in 3 thickness:
Thin—.043" (Cat. No. 314-1/2 or 321A)
Medium—054" (Cat. No. 314 or 321B)
Thick—.067" (Cat. No. 315 or 321C)
In addition, each of these may be purchased in either 54" long strips or in a continuous roll of 12 strips.

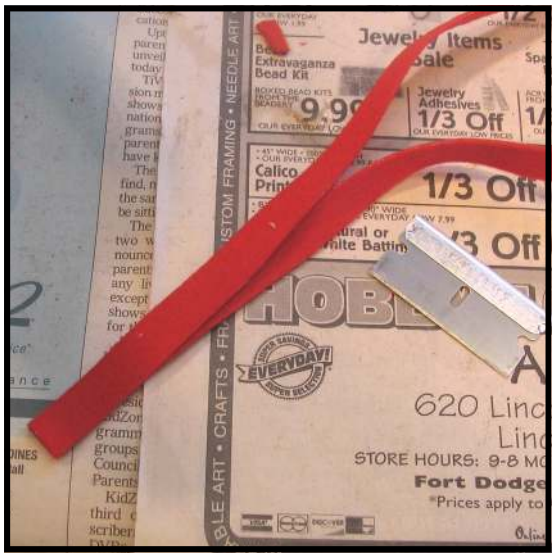
Step 13: Check the width of the front rail pins to make sure they are standard .146". To measure, turn one pin 90 degrees and use your micrometer to measure the pin at its narrowest point. Be sure to turn the pin back to its original position once the measurement has been taken.

Step 14: Select aluminum key bushing wedges in the correct size. For the standard size front rail pin, use .147" wedges (Cat. No. 379). Also available are .162" wedges (Cat. No. 380) and .138" wedges (Cat. No. 381).



Step 15: With a very small carving tool, scrape the inside of the recessed area on either side of the mortise clean. This step works better if the wood is has been allowed to dry.

Step 16: Place the first key to be rebushed in a vise such as this machinist vise (shown) or a clamp-on vise (Cat. No. 288) to hold the keystick steady while using both hands to work with the brush and felt.

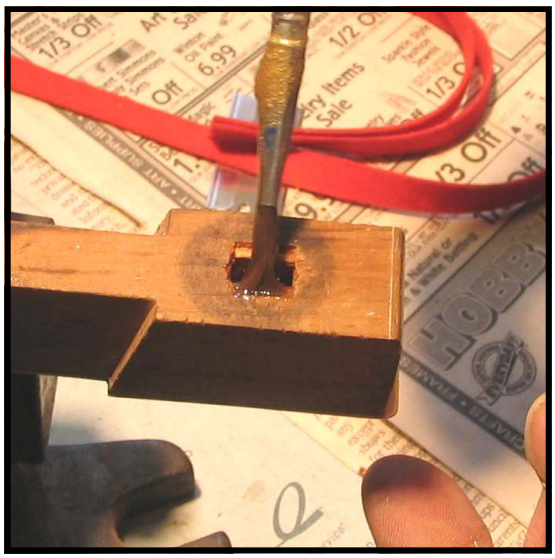


Step 17: Have two strips of bushing cloth placed nearby ready to pick up. Make sure the ends are squared off evenly with each other.

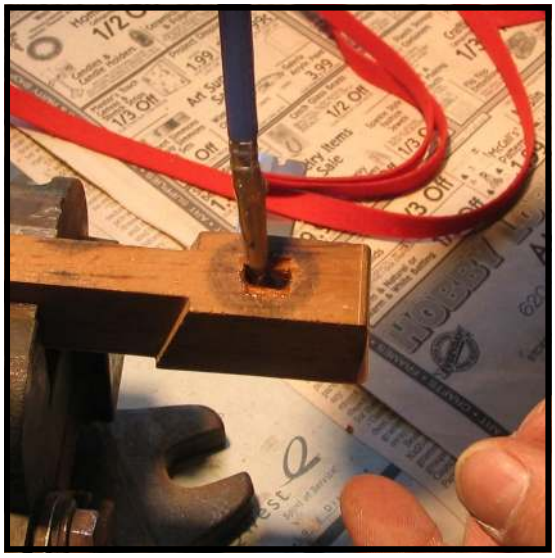
Step 18: At this point, check your hot glue before use. If it has developed a "skin," stir it vigorously with a hammer shank for several seconds to remelt the cooled surface layer. The consistency should be neither too thin (which results in over-penetration of the glue into the felt), or too thick (which makes it hard to brush inside the narrow mortise of the keystick). Add water to thin, more crystals to thicken.

Step 19: Use a small, camel hair brush (preferred), or a disposable glue brush (Cat. No. 438) to apply the glue. (If you do use a disposable glue brush, first cut off about half of the bristles, and you will find it easier to use inside the mortise.) Dip the end of the camel hair or disposable brush into the stirred glue.

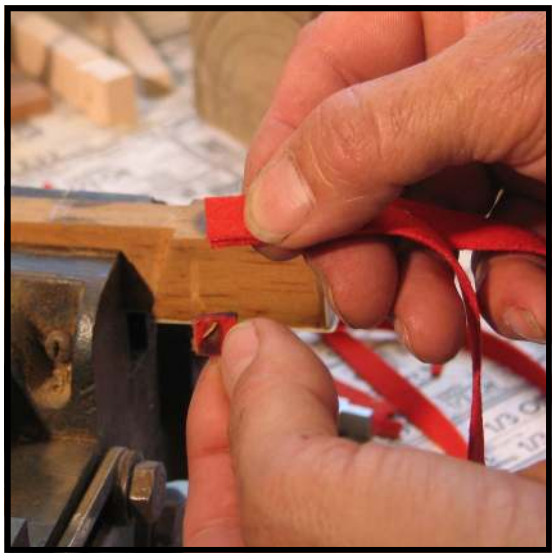
Step 20: Before applying glue, wipe any excess off on the side of the glue pot. The brush should not be loaded to the point where glue is dripping from the bristles. Before applying the glue, fan the brush out slightly as shown against the edge of the pot.



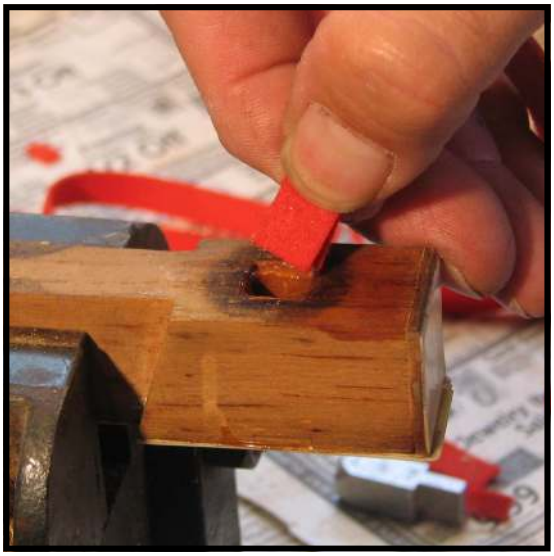
Step 21: With the fanned out bristles, apply glue to the recessed area on either side of the mortise.



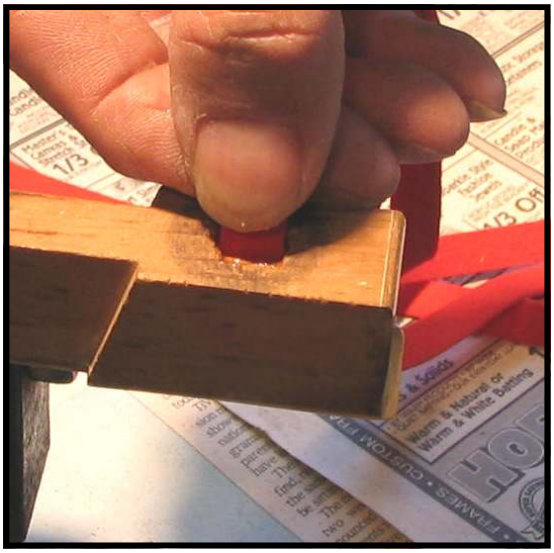
Step 22: Next, without returning the brush to the pot for more glue, coat both sides of the interior of the mortise by inserting the bristles into the slot, and using a gentle twirling motion of the brush. *If the glue seems "stringy" at this point, add a small quantity of water to the hot glue mix so that it's a bit runnier.*



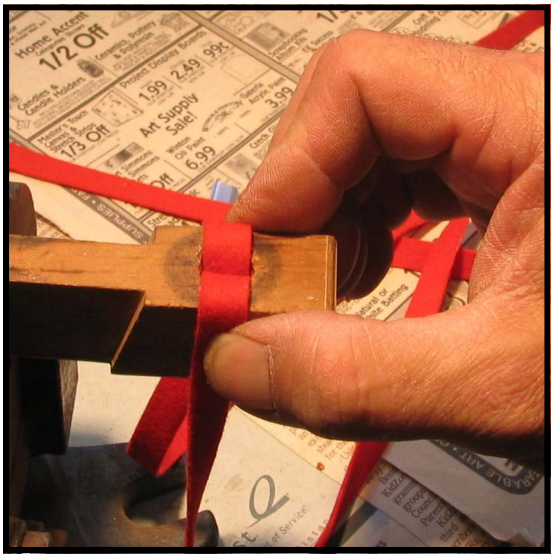
Step 23: Putting the brush back in the glue pot, pick up the strips of bushing cloth that you have at the ready. Holding the combined lengths of cloth in your right hand, pinch off a segment equal to the original length of the bushings which were in the keys.



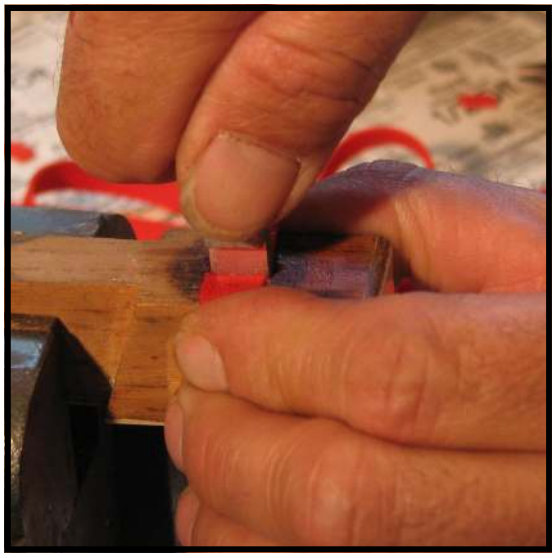
Step 24: Insert the end of the combined felts into the mortise up to your fingertips.



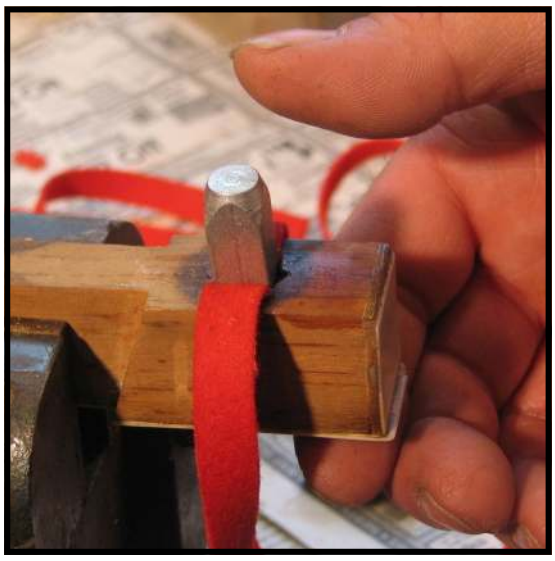
Step 25: Push the combined strips of felt gently to one side against the tacky glue to hold it for a second while you release your grip.



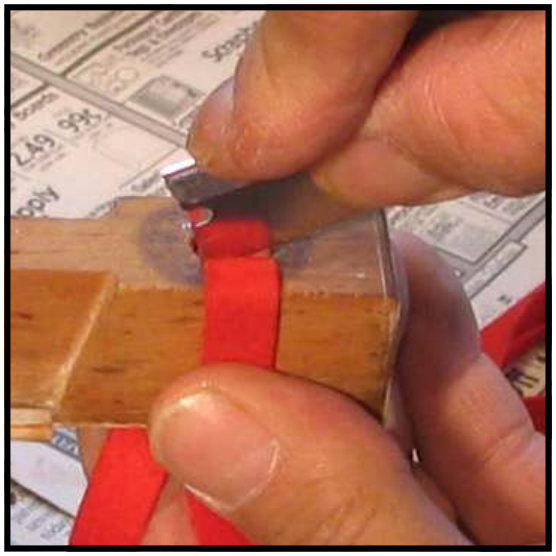
Step 26: Being careful not to pull any of the inserted length of the bushing cloth from the mortise, separate the felt strips and fold either strip over the side of the key.



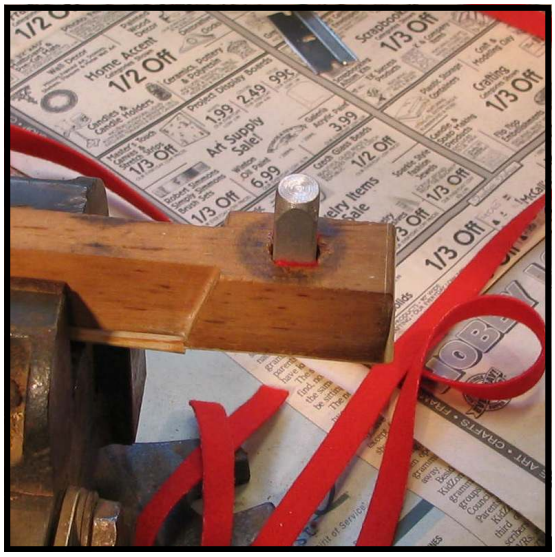
Step 27: Hold the felt firmly against either side of the key with one hand. With your other hand push an aluminum key bushing wedge of the proper size into the mortise all the way in so that the shoulder of the wedge is firmly seated against the underside of the key.



Step 28: Release your grasp on the felt and the wedge. The wedge should fit solidly in the mortise. It will correctly size the bushing as the hot glue cures.



Step 29: Use a new razor, or felt cutting knife (Cat. No. 213) to slice the bushing felt on either side of the body of the aluminum wedge. This should be done as soon as the wedge is firmly in place so that the felt is seated firmly in the recess, instead of being draped over the side.

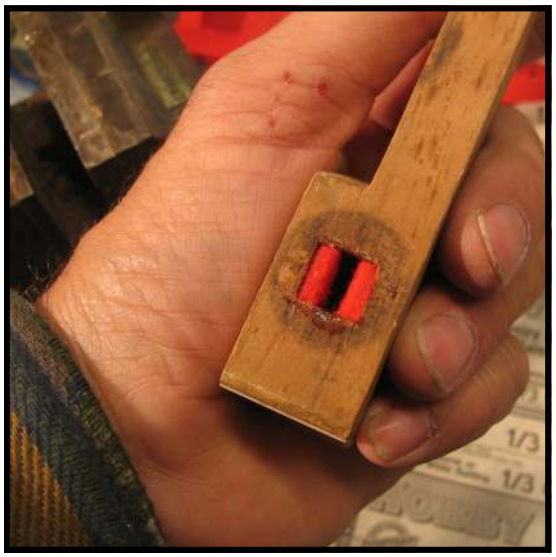


Step 30: The cut edge of the bushing felt will be plainly visible at this point. Proceed to the next step immediately, so that the glue is not allowed to cure with the felt lopped up over the edge.

Step 31: Use a jig which fits on the underside of the key to support the end of the key at the same distance (3/4") that the body of the aluminum wedge protrudes from the mortise.

Step 32: Place the key with the jig in place in a vise to apply a small amount of pressure to the wedge while the next key is being worked on. This step will help push the felt down squarely into the recessed area on either side of the mortise. *Note—For keys that do not have a recessed area for the bushing cloth on either side of the mortise, follow the directions given for step 45 and 46.*

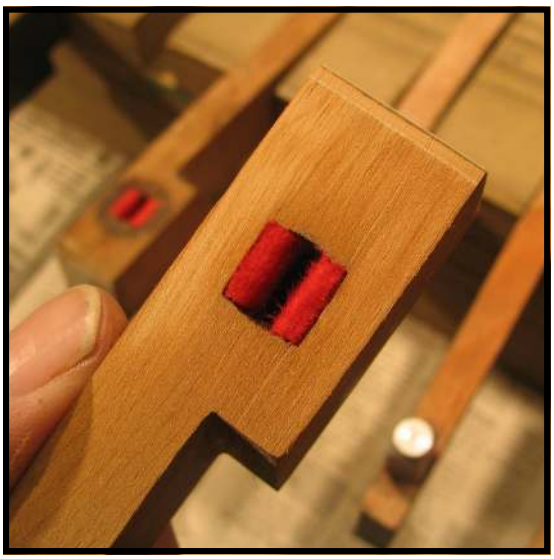
Step 33: As each new key is bushed and allowed to remain clamped in the vise for a few minutes, place the finished key with the bushing wedge in place into the keystick holder. Do not remove a wedge until it is needed for a newly bushed key. Having at least a dozen wedges will allow you to work at a comfortable speed, while the glue is allowed to cure with the wedge in place for each completed key.



Step 34: When the wedge is at last removed, examine the new bushing to make sure it is solidly glued into place. If any looseness is detected, remove the bushing and redo.

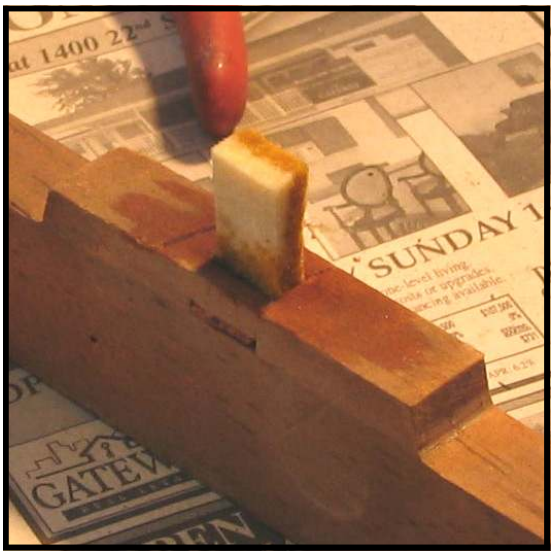
Step 35: Sand the underside of each key with 150 grit sandpaper. Instead of holding the sandpaper in your hand to sand, place a sheet of sandpaper grit side up on the bench, and push the key back and forth against it while pushing down.

Step 36: When the sanding is complete, re-examine the bushing to make sure it is still is intact. Sand off all discoloration to create the appearance of a new key.

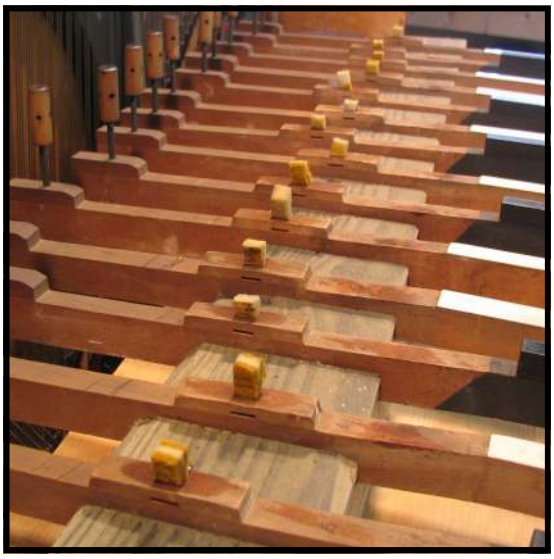


Step 37: The key with its new bushing, ready for installation in the keyframe.

Step 38: As each group of keys is completed, and returned to the keyframe, move the remaining keys on the keystick holder to the left, thus keeping the process moving along.



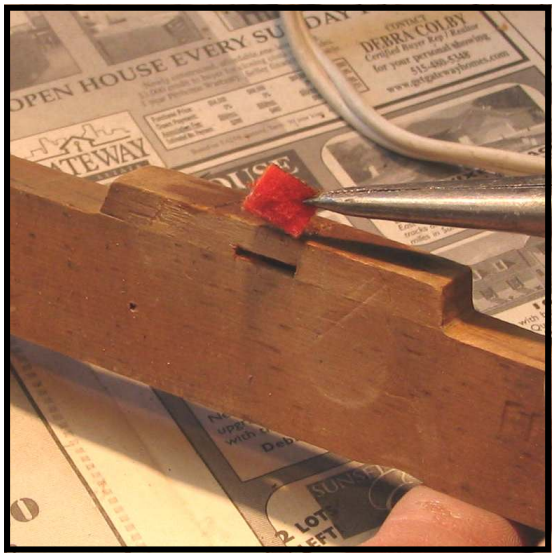
Step 39: When it's time to begin working on the center rail bushings, apply a saturated felt wedge into the mortise of each key button. The wedges for use on the center rail bushing need to be cut narrower than the ones used on the front rail bushings.



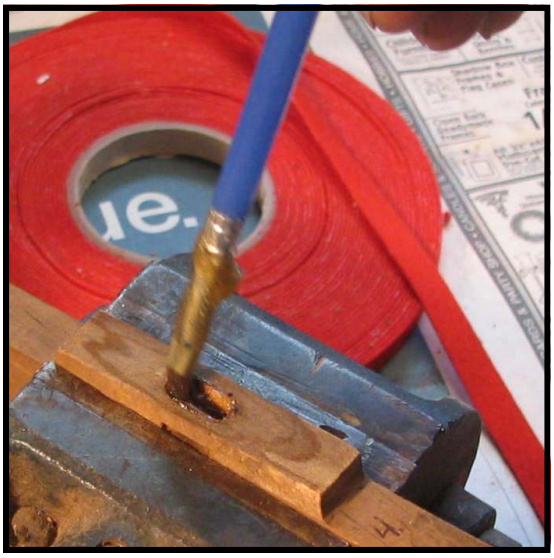
Step 40: If you have more than one keystick holder, the process of rebushing the center rail bushings may start as keys from the front rail bushing procedure are completed.

Step 41: Work across the set of keys twice—once to replace the front rail bushings, then again to replace the center rail bushings. This type of work can either be done as a single day's work, or can done a little at a time when time permits.

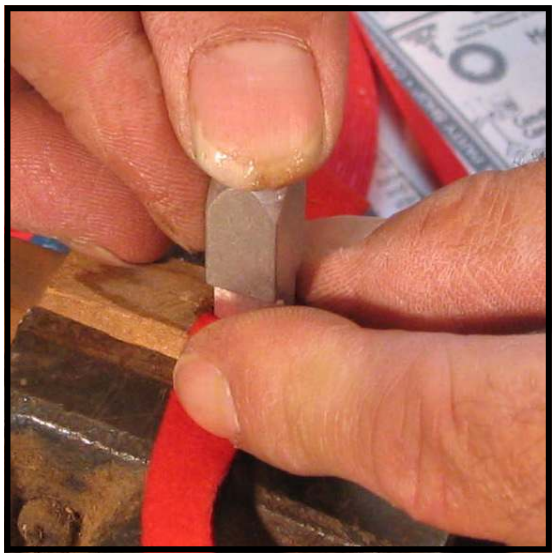
Step 42: If the key buttons are slotted on the sides, with the bushing felt extending into the slot, use a small, flat bladed carving tool to scrape the felt loose and to push it into the mortise for easier removal.



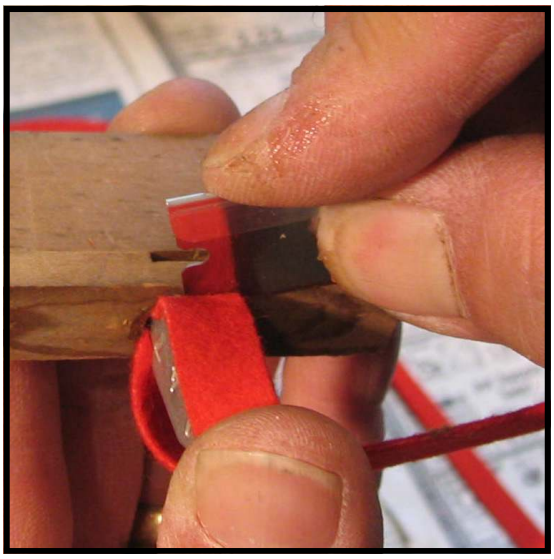
Step 43: Use needle nose pliers to remove the bushing from the slot. If the felt does not come out easily, repeat step 40, then try again. If this fails, use the bushing cloth remover to finish the job. If, in the process of attempting to remove the bushing felt, one or the other side of the bushing falls further into the mortise, turn the key over and slap the key button against the palm of your hand. Usually, the felt will fall out at this point.



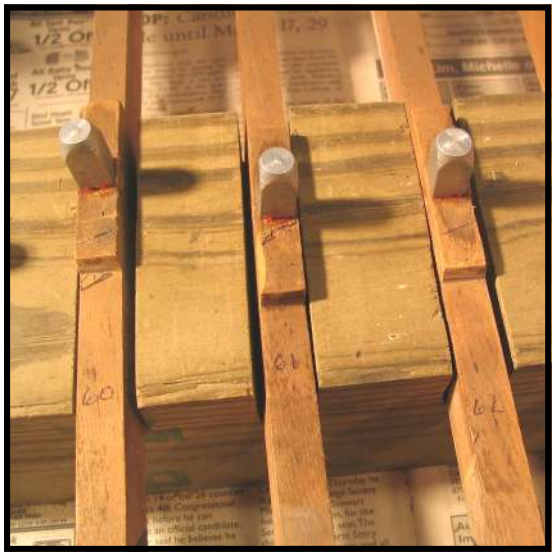
Step 44: Apply hot glue to the inside of the mortise, using a gentle twirling motion to the brush to evenly coat the slot with glue.



Step 45: Using the same technique as was used in felting the front rail bushing, insert both sides of the bushing into the slot at one time. Spread the two strips of felt apart, and push in the bushing wedge with one hand while holding the felts in place with the other. This time, however, do not push the wedge all the way in quite yet. Instead, leave the shoulders of the wedge approximately 1/8” from the top surface of the key button, to allow for the next step.



Step 46: With a sharp razor, slice the bushing felt flush with the top of the key button by running the sharp corner of the razor along the metal prong of the bushing wedge. Once the felt on either side of the bushing has been cut, push the wedge all the way into the slot.



Step 47: Keys are lined up in the keystick holder, with the wedges in place in the key button. Leave each wedge in place for at least an hour to make sure that the slot is properly sized.

Step 48: The final step is rebushing keys to ease the bushings. If any key is dragging on either the center pin or front rail pin (make sure that the oval front rail pin has not been rotated in its hole), use a pair of easing pliers (Cat. No. 243) to gently compress the bushing felt of the sluggish key. Easy does it! If you hear wood crunching, you're applying far too much force. You want a snug, but not a tight, fit.

Tool and Supplies

For your convenience, all the tools and supplies necessary to complete this repair are listed with corresponding catalogue number.

Tools:

Electric glue pot.....Cat. No. G-1155
Key bushing wedge clamp.....Cat. No. 151
Jaras electric key bushing cloth remover.....Cat. No. 909
Heat control unit.....Cat. No. 906
Needle nose pliers.....Cat. No. 239
Starrett micrometer.....Cat. No. 3338
Aluminum key bushing wedges.....Cat. No. 379, 380 or 381
Clamp-on vise.....Cat. No. 288
Felt cutting knife.....Cat. No. 213
Key easing pliers.....Cat. No. 243

Supplies:

Dry Cabinet glue.....Cat. No. 399-1/2
Hammer felt trimmings.....Cat. No. 303
Key bushing cloth
- Thin.....Cat. No. 314 or 321A
- Medium.....Cat/ No. 314 or 321B
- Thick.....Cat. No. 315 or 321C

Disposable glue brushes.....Cat. No. 438

Important note: Ordering information is given for the use of Schaff account holders only.

To order, call Schaff Piano Supply at 1-800-747-4266

Notes on Procedures