IVORY REPAIR
Acyrlikey
Dick Wagner
Portland Convention
3/27/2003

The PTG Journal July 1995 issue is all about ivory.

Buffing

When buffing ivory, use a lot of compound. Be careful around the notches where the sharps come in. Have the buffing wheel rotate off the edge rather than onto the edge of the key.

Bleaching

To bleach ivories, refer to the class hand-out from the Portland 2003 Regional PTG convention. Bosendorfer also has a hand-out on how to bleach keys.

Now that it is possible to do a quality acrylic repair on ivories, it is no longer necessary to replace chipped ivories. However, if the head or tail is missing, it is necessary to do a good replacement. The problem is that it is increasingly difficult to find actual ivories, especially matching ivories.

International Piano Supply is selling new ivory. David Warther at www.ivorybuyer.com is Amish and makes intricate carvings of sailing ships in ivory. His father did steam locomotives. He makes his living with a museum showing these carvings. His wife makes knives. The ivory ban says that it is legal to trade ivory within the US but not across boundaries. Since it's already here, we don't have to worry about where it comes from or if it was poached. He goes around to museums, estate sales, etc. where the ivory is fully documented. He makes everything from pool cues to piano key tops. Old ivory can be obtained from Shaff, Strapp, and eBay. It is a good idea to salvage old ivories from recovered piano keytops.

Replacing

The stock must be clean. Soak the heads in warm soapy water for about five minutes. To prevent warping or curling, to dry them, lay them on paper towels and flip them over about every twenty minutes like pancakes. A denture manufacturer makes a metal press with two metal plates. Richard stacks them front to back, wraps them in industrial paper towel, clamps them and leaves them for a couple days. Ivories should be stored exposed to light.

Bill Spurlock has invented an accurate jig for hold the key and ivory for sanding to that the joint is perfectly flat and matched. Jointer. You can also get sanding blocks and cosmetic files from cosmetics stores. Another way is to use a stationary belt sander.

There are lots of glues to use to glue heads, tails and fronts on. There are ivory wafers, PVCE glue, C&A glue, titanium dioxide oxide mixed with cold hide glue, piano makers glue, Tuner's Supply ivory cement. Don't use contact cement: it turns yellow, you can see it through he keys, and it is not a tight fit. Use about a beebee's pile of pumice between the tail and the head to be glues on. Work the tail agains the head witgh the pumice inbetween, using the pumice as an abrasive to carve an clean joint. You are using the front and the back as tools to make them fit together. This is how they grind telescope mirrors and lenses. Use toothpicks or popsicle sticks for applying the glue. Make sure that you match the correct key head with the proper key, e.g. A to A. Set the ivory aside, mix some PVCE glue with titanium dioxide, apply a thin film on the key stick itself. Avoid the area of about $1/16^{th}$ inch to avoid squishing the glue out. Drop the key on at an angle and slide it in place. Smooth the head with your finger so it seats down. Place the plate on top, applying pressure with the clamp at a slight angle, cinching slowly, then take a hammer and tap the front of the pate to make sure the head is being driven back to the tail. Make sure the key is straight as it is being clamped. Let the glue squeeze out. It can be peeled off when hard with a single edged razor. Wait until the glue is solid and dry before buffing or the heat will loosen the glue.

Chip Repairs

AcrilikeyII uses a chemical called polimethylmathatcerlay, which is similar to what dentists use, and is an extremely good bone glue. There is a liquid and powder, which, when mixed, form into a plug that fills in gaps, bonds and holds for a very long time. It can be buffed down and ends up with a gloss that is very similar to ivory. The liquid is very smelly. It's safe, but you need good ventilation. When it's

done, it looks more like ivory than plastic because ivory is more translucent. Plastic to plastic makes more of a line and is not as invisible, but it will bond.

1. Clean the key. Dirt in a chip would be a repair of dirt rather than of the key. Use a little needle file and dish out the chipped area so that there is a nice beveled area. Do it from the bottom of the chip as well. This makes a kind of lock as well as cleaning it out.
2. Cut an actual channel on the key front under the lip of the key to allow a bead of the film material to run along the width of the key. This makes a solid bond that strengthens the entire repair, and build up the lip of the key as well.
3. Mix the repair material. There are two powders, both of which are mixed with the liquid. The first powder is an ivory white color with pigment in it, and this is used 95% of the time. Take a mixing cup, add the white powder and a little yellow powder. Shake it up and hold the dry mix up to the key to match colors. Most keys don't need the yellow powder.
4. Draw out a portion of liquid, maybe 4-7 drops per scoop, but experiment with what works. Immediately it will start to congeal. Apply with a toothpick. There is a temptation to do several keys at a time, but avoid this inclination. As soon as the mix is watery and runny, apply it to the key. Within twenty seconds it will start to bond.
5. Lay a piece of cellophane tape lightly across the top of the key. Turn the key upside down as soon as the mix is ready and stick the repair material all along the lip and the damaged area. Slightly lift the upside-down key off the tape to let a little of the mix to flow to the top.
6. File and shape to the key contour once it is set. When the tape is removed, the adhesive from the tape will be stuck to the top. Use the file that comes with the kit, starting with the roughest grit, and take off the bulk of the material. As you get closer to the ivory itself, use increasing lighter grits, taking off as little ivory as possible.
7. The mototool stone wheel bit is helpful. The black mototool dressing bit is used to clean, shape and modify these stones. Use this tool to take away the bulk of the material fairly quickly, especially under the lip. This is helpful when doing a number of repairs at once.

The shelf life of the kit is guaranteed for a year from the date of purchase, and that's for the liquid. To tell if the liquid is getting old, it starts out with a clear amber color, but as it gets older it turns more yellow. To prolong the life of the monomer, refrigerate it, keep it at constant temperatures, put the cap on right after use, and keep dust out of it.

The original kit came from cosmetic material, which didn't look like ivory, so a second pigment had to be added. These pigments were adulterants to the actual mix, so they weakened the bond. The new kit has premixed pigments. Buffing in the field use a mototool, which is not as good. Use finer grits of paddles. Also use Maguire's cut polish with your finger or a cloth and buff the area. In the shop the wheel provides a finer finish.