International Association of Penturners

Creating Custom "Art Pens"

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Or, How To Take A Whole Week To Make A Pen

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http://www.library.davidtilson.com/techniques/penmaster.html

My goal here is twofold: to show the general design process I use in creating my pens, and to discuss many of the different techniques I use (or intend to use in the near future) in executing the designs of my wood and composite pens.

Safety First!

Safety in the workshop is YOUR RESPONSIBILITY alone; I make no warranty as to the safety of any technique or tool shown or described on this site. Before beginning any project, you must understand woodshop safety, know how to safely operate any machinery that is to be used in the project, and understand the safe use and any potential safety hazards involved in the use of all materials to be used in the project. See the General Safety Notice and the Chemical Safety Note for additional information.

I was fortunate in getting to spend 12 years in college, migrating from one department to the next, and ending up with a background in the physical sciences and business, and a degree in the Arts as a theatrical technician. During many hours sitting in the dark backstage, waiting for the next cue, I was able to view the creative process for the many different art forms that converge in the theater, and note the common characteristics that make for good graphic, sculptural, performing, and literary art.

I've tried to use those characteristics, vague as they are, in my own work, and I'll attempt to show them to you as I outline the processes I use in my own chosen form of artistic expression: namely, pens.

D E S I G N I N G T H E P E N

I'll start with a "brief" overview of the design process I use to create my pens. I go through each step and revisit each step as necessary until I've arrived at a design to which I'm willing to commit a $10 to $50 hardware kit.

I use two methods of design: what I call inside-out and outside-in. Inside-out design means starting by designing parts, or design elements (the insides), then assembling these into a final design (i.e., form follows function). Outside-in design means starting with a sketchpad and drawing random ideas for the look of the finished project (the outside), then figuring out how to actually build that design (i.e., function follows form). I find that designing from the outside-in produces more creative, "artsy" designs, and inside-out design allows me to practice, and explore the possibilities of individual techniques, while typically producing more textural, patterned designs.

Picking a Theme

The goal in any "fine art" is to convey a message of some sort, but not to just come straight out and say it. This results in a certain degree of ambiguity and forces the viewer to think. The thinking aspect is what keeps a work of art interesting and relevant, even after it has been seen for many hours, days, or years, because each time it is viewed, the progression of thought makes it somehow a new and unique experience.

A theme (the "message" of the artwork) can be a person, place, thing, picture, event, arbitrary concept, flavor, scent, sensation -- anything at all, including things you wouldn't normally think of expressing in a visual form, can give you a focal point around which to design a pen. What's important is to have a single, unifying concept. Repetition of one or two design elements is another simple way to tie the elements of an arbitrary design together to create a balanced whole. Symmetry is always important, whether it involves straight copying, mirroring, or echoing or transforming of other elements in the design. Note the tendency in classical music to repeat themes, explore variations on themes, re-key themes, play the same melody with a different tempo or meter, etc.

My pen, “Twilight,” (above) was based on a combination of Van Gogh’s “Starry Night” and my own impressions of dusk in the California desert. It is an outside-in design that produces the effect of a desert skyscape just after dusk, using scalloping, dyeing, and inlay techniques. The design of this pen is made to progress from one end of the pen to the other. Since this is a desk pen and the cap is not made to post, I didn't have to worry about the possible effect of rearranging the design when the cap is removed. Repetition is achieved indirectly: by using dark woods to represent hills at the bottom, and an ebony cap (not visible) with a moonburst on top of the cap, I feel the design gains just enough symmetry to balance.

Inside Out

Above are two pens designed from the inside out; that is, I started with a technique for creating a shape on the finished pen and created a design around the technique. The top pen uses a scaling pattern that spirals around the pen, using plywood for greater effect. The design was filled out with silver inlay, and segmented and laminated design elements. The bottom pen was to test a scaled pattern built backwards and a pattern made with scales layered at various angles. Both pens also tested methods of customizing the pen's size and shape by scrapping certain parts of the hardware and replacing them with wood. Note the repetition of design elements at either end of each pen. Again, repetition does not need to be a straight mirroring of the design; an echoing of the pattern works just as well, as in the lower pen, or even a variation on a theme, as in the upper pen.

Choosing Colors & Materials

An artist's color wheel is very helpful in understanding color relationships. Most woods generally fall into brown versions of red, orange, or yellow, but don't limit yourself to using only wood; acrylics, stone, leather, snakeskin, corn cob, shell, metals, vegetable ivory, and other materials can offer interesting colors, textures, weight, and the qualities of being unique, rare or exotic to a pen. Again, repeating elements (patterns, materials) add symmetry and unify the whole design. It's usually best to limit yourself to just a very few thematic elements and colors, or you risk overwhelming the design (and the viewer). Remember, K.I.S.S. (Keep It Simple, Stupid; or Keep It Short and Simple); if you use every color of the rainbow, your pen is guaranteed to clash with the user's shirt pocket or purse, unless they're wearing Jerry Garcia.

Choosing Hardware

Hardware color and shape should work well with the rest of the design, and don't be afraid to creatively customize the kit! Some hardware can be easily customized for a tall desk pen, or an outlandishly shaped pen. Do keep in mind the size, weight, feel, and other practical aspects if the pen is meant to be used regularly. The size of the hardware kit affects the practicality and feel of the finished pen, but also limits how big a design you'll be able to fit into the blank.

Determine its Shape

The contour, or profile can completely change the "feel" of the hardware. You can customize the hardware and shape, if desired, by making your own parts, or "Frankensteining" various pen kits.

Pen contour guidelines:
* No straight lines
* Smooth contours for a comfortable gripping area
* Avoid sharp outside corners
* Avoid Small Grooves That Collect Grime

One thing I quickly noticed about almost all "fine art" is the dearth of straight lines and right angles. I have yet to see a theatrical set where walls are anywhere near square to one another, because the designers realize that angled and curved lines are far more powerful in conveying impressions of mass and stability or of lightness or even of uneasiness and instability. The Greeks also knew the power of a subtly curved line, as evidenced in the complete absence of any truly straight lines in the Parthenon in Athens.

Since a writing instrument is usually meant to be a piece of functional art, there are also certain technical and functional considerations in the design of a pen. I've noticed that art is as much about thinking outside of the box as about knowing when to color inside the lines. Therefore, whether adhering to any artistic rules or breaking them, it should always be a matter of conscious choice. Whether or not you can explain why you choose what you do is entirely irrelevant, as long as it's a choice. Even an accident can become a choice: whether to fix it or leave it - that's called serendipity - and you learn from it either way.

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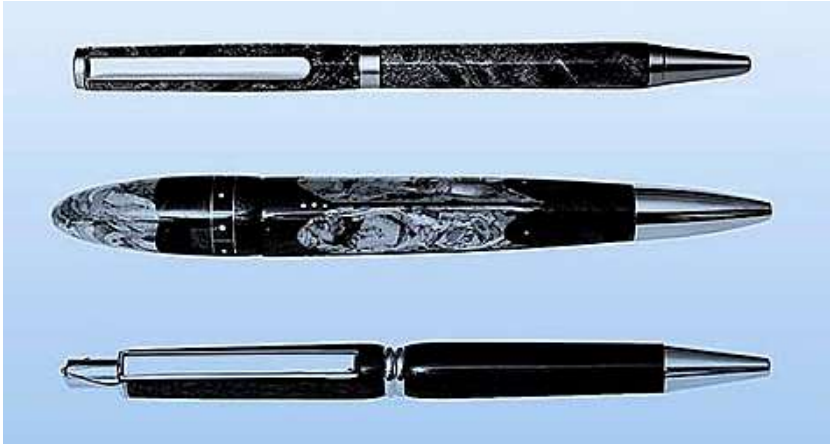
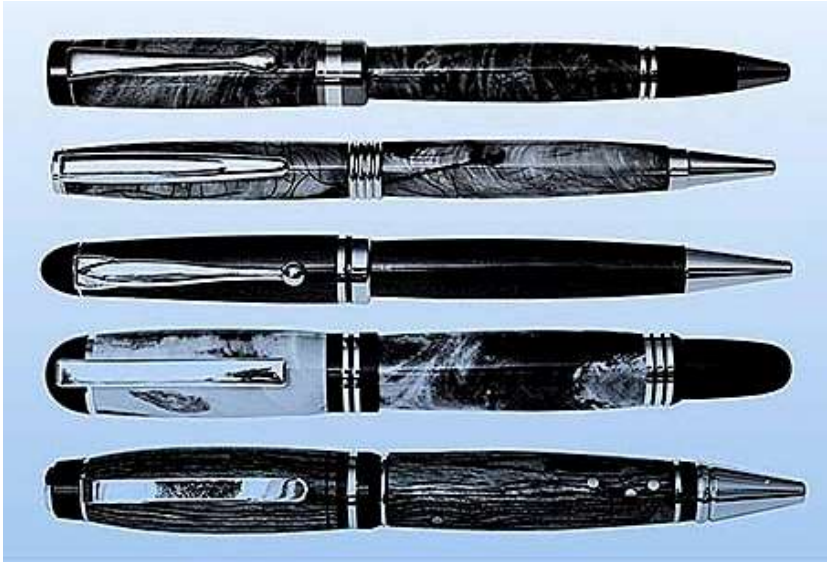
1. Nearly Straight / Tapered

Truly straight lines weaken the shape, but a slight outward bow in the line can correct this. Tapers strengthen the line even more, and often give a more dynamic, modern look to the pen.



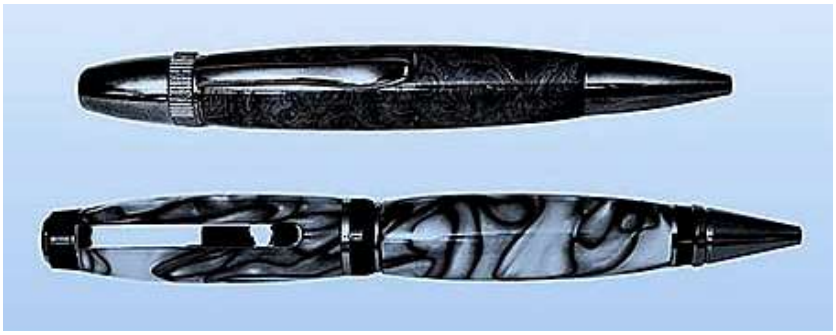
2. Barrel Curve

A slight barrel-shape is the most common treatment for a pen blank, as it looks strong and feels good in the hand. The apex of the curve could be placed near center, or a third of the way from one end to create an asymmetrical curve (#4).



3. Heavy Barrel Curve

This goes beyond merely making a pleasing line. It's a good way to add weight (both visual and actual) to the pen, or to make a medium sized pen into a large, "healthy" feeling pen. Just be careful to avoid your pen becoming a sausage or a football.

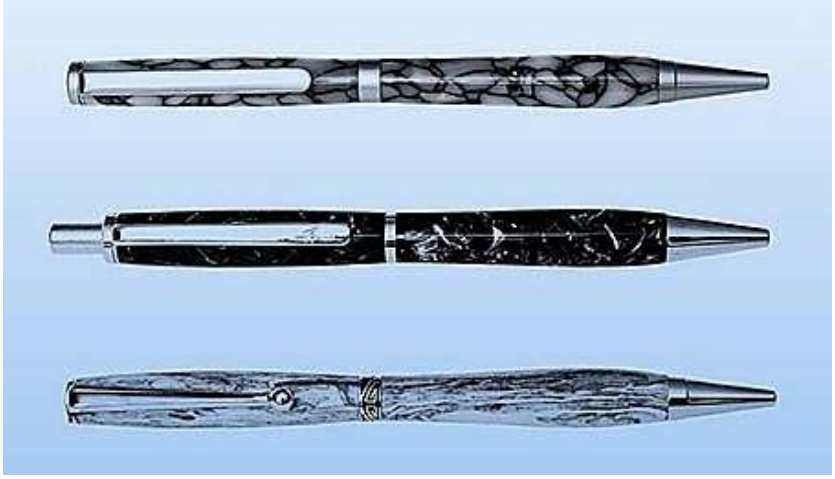


4. Asymmetrical Curve

Asymmetrical, or accelerated curves, combine a taper with a curved line, adding a dynamic look to the pen, and can also help to fine-tune the balance of the pen in the hand. I like to place the apex at 1/3 from an end (of the barrel or of the pen). An apex at ¼ from an end can also work well.

5. Flared Grip

I often use an asymmetrical curve on the lower blank of 7mm pens to make a thicker part to grip.



6. Reversed Curve

A reversed curve, with the blank turned hollow, can be used to make a very modern-looking pen, as well as shifting the weight of the pen. If the other barrel has a barrel curve, the two curves mirror each other nicely. Of course, be careful to leave some wood to cover the brass.

7. Simple Detailed

I personally tend to prefer using wilder woods and keep the decorative turning to a minimum. A bead here, a decorative groove there, or maybe some light spiraling is about all I usually will do.

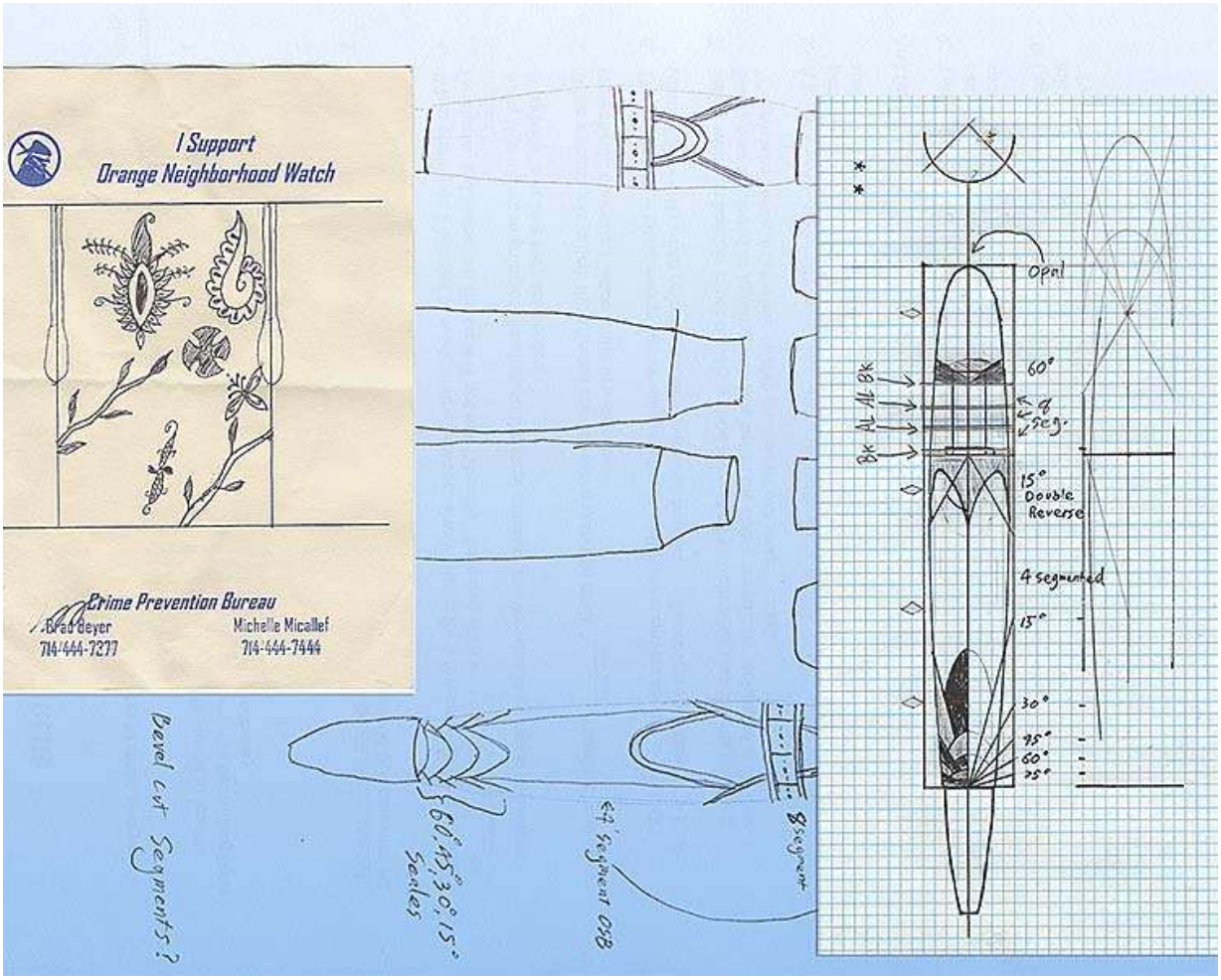
8. Complex Detailed

A pen can be viewed as just another spindle turning project and decorated accordingly. This lets the turner use plainer woods and add his or her own decoration. Miniature beads, coves, urns, and grooves show off the turner's skill; just remember to make the grip area reasonably comfortable and be aware that the clip may not be an option, depending on how wild a shape you make.

9. Freeform

Finally, a pen could look like a twig, bamboo cane, flower, mushroom, cigar, bullet, dart, sword, dragon's tail… you're limited only by your imagination and by how much time you're willing to spend making the pen.

Scale Drawing



My designs will often actually start with this step and end with it, as I sketch design ideas, make notes about possible themes and concepts, sketch possible construction techniques, and generally waste a lot of paper along the way to a final scaled plan of the finished pen. Keep a sketchpad for ideas; it helps to refine an idea and those notes and doodles often come in handy later, as the design elements may prove useful in another design, or they may spark the imagination to a new possibility or the solution to a vexing problem. Not knowing how to draw is no excuse: if you can sign your name, you can doodle, and if you can doodle, you can draw well enough for this! Just pretend you're back in junior Social Studies, only now you can enjoy a glass of chardonnay while you doodle.

It's important, when you're building the design up solid or painting it, to plan it out so things will end up in the right places on the assembled pen, including the pen's clip. For a drawing template, just photocopy a finished pen, cover over the wood parts on the photocopy with strips of paper, draw a centerline down the middle of the pen, and copy the copy at 100% or 200%.

Finally, one of the trickiest parts of designing a pen, or any work of art, for that matter, is knowing when to stop. Half of the art actually lies in what is *not said*, or shown, but rather *implied*, leaving that critical gap for the viewer's mind to fill, and engage in thought. The thought process is what makes it a new, fresh experience (to some degree) each time you look at a really good work of art, and goes a long way toward keeping that artwork interesting and relevant, even weeks or years later. Am I getting too repetitive?

CONSTRUCTING THE PEN

There are many techniques that can be used to make a pen. I'll frequently use every major power tool in my shop, as well as a number of specialty tools like dental picks and micro drills, to make a single pen.

The goal here is simply to highlight a few common techniques and some uncommon ones that show promise in creating a unique look and feel in a pen. These are by no means even a representative example of what's out there, they're just a few of the ones I personally find the most intriguing at this point in time.

Many of these techniques I've used and developed on my own, and some of them I haven't yet had time to practice very much yet, but other pen turners have.

Segmenting

I use segmenting to refer to making wedges of material, assembling the wedges to make rings, then stacking these rings to make a brick-like pattern or a row of rectangles around the pen. Segmenting gives the appearance of the pen being built from tiny bricks, except the bricks can be different sizes and colors, or even have patterns built into them, creating geometrical patterns on the pen.

You can use the methods of Ray Allen or Malcolm Tibbets to make a segmented pen. The process can be the same as for full-scale segmented work, just miniaturized for use on pens. I use a bandsaw for most rough cuts, then sand the wedges to size and shape using a disk sander with a specialized table and angle fixture. I use a dental pick to hold the wedges while I sand them. I find that a sanding disk of 80 grit offers a good balance between fast cutting with little or no burning, and still getting a reasonably smooth surface. Layering veneers between the rings helps to hold the blank together when it is drilled. This technique works well for making miniature "feature rings" where each wedge is glued up with a geometric pattern inside.

Another way to segment a blank is to make long wedges, longer than the final blank: glue them together, drill down dead-center for the brass tube, then cut the rings off of the drilled blank and reassemble them around the brass tube with some CA glue. This method allows the rings to be stacked without veneers

between successive levels, and also works better when metal "veneers" are used in the design. You can also cut the rings on a slight diagonal for a very different effect once they are reassembled. See more at http://www.distinctiveturnings.com/tutorials/SegPenBlanks.pdf

Scalloping

I got this method from Mark and Brian Gisi, whose pens belong in the Smithsonian. It took me awhile to figure out exactly what was going on, but it's really a simple technique. You're basically cutting the blank on a diagonal and gluing a wedge of different material in its place. This technique uses the geometric principle that a plane passing through a cylinder on an angle will intersect the surface of the cylinder to produce an ellipse, or, in this instance, an elliptical arc. The overlapping of these arcs at various angles produces the variety of dragon scale, fish scale, and tulip petal patterns, and the fact that usually less than half of the ellipse is visible disguises the simplicity of the technique.

The keys to scalloping are concentration, methodical layout and a good, non-stick gluing surface (I use a block of UHMW Polyethylene). Since the design is built up by the repetition of cutting and gluing steps, one variation in the process can produce a completely different look. The pen will appear to have scallops or scales, and variations can look like fans, dragon scales, fish scales, the leaves on a bamboo shoot, flower petals, ranges of mountains, swag curtains, etc.

Laminating

Laminating can be simple or complicated; you can glue up a simple racing stripe, or a curved lamination cut on the bandsaw or scroll saw; or even cut a classic "double cross" on a modified miter saw or table saw. This is one of the most versatile techniques, and the variety of effects that can be produced is nearly unlimited, from rectilinear geometric patterns to sinuous ribbons to the classic 1950s nuclear atom. If you cut the blank in a curved fashion and glue in a contrasting veneer, you can produce ribbon-like or wrought iron fence-type patterns, like those of Steve Schweitzer. Another technique is called the 360 Herringbone, which produces a herringbone pattern that wraps around the pen. There are several different techniques for this, one of the more spectacular I've seen is by Neil Pabia.

Casting

Another hugely versatile technique, casting forms the blank around the tube (usually), or can be used to "fill in the blanks" (Ha!) when you are faced with weird stuff like "moonscape" burl faces, pinecones, or banksias pods. You can wrap a brass tube in pretty much anything and cast the blank around the tube using polyester casting resin, or you can also build up Mod Podge decoupage material or epoxy over your covered tubes.

I haven't even tried casting yet, other than to "fill in the blanks" in banksia pods. This is a great way to make use of what would otherwise be trash by filling in bark inclusions, cactus skeletons, pinecones, etc. to make a solid blank. See Turn Tex Woodworks for some neat ideas.

Another technique uses casting as an infill around a scroll sawn design, like Jeff Powell's designs.

Yet another method by Shane Whitlock is to wrap the brass tube in scroll sawn wood or plastic shapes, paper bits or stamps, feathers fastened like a fly fishing lure, dried flowers, snakeskin, or whatever else, and cast the tube inside the resin block, with plugs to keep the casting resin out of the tube. The ends of the cast block are cut away, along with part of the plugs, and the bits of plug stuck inside the tubes are carefully removed. Casting materials include epoxy, Mod Podge decoupage resin, and acrylic casting resins madespecifically for the task.

See more about casting with polyester resin: https://www.penturners.org/resources/categories/casting.4/

Adding Inlay

Inlay can include traditional wood inlay or inlay bandings, as well as metal, ivory, plastic, and cast-in-place inlays like The Inlace Book. Making a recess for the inlay can be as simple as drilling a hole for a sterling silver wire "star," or it can involve hours of careful cutting with an X-acto knife and a small chisel. Or, you can cheat and have "Laser Larry" cut it for you. Whichever way you choose, it's a good idea to start out inlaying using a light and a dark wood together, so any gaps will disappear against the dark wood.

Dyeing

Dye adds completely transparent color to the blank and is one way to make the desired wood grain pattern and texture fit into the color scheme desired for the pen. The wood should be turned and sanded, ready for finishing, before applying the dye (most woodworkers call it aniline dye). Sanding with fine paper between coats of different dyes can produce an iridescent effect a-la Jimmy Clewes. Dye should be applied and sealed before adding inlay, paint, or gilding to protect against bleeding or cutting through the color.

Painting

Paint and tinted finishes may sound like a brute force technique to apply a design to the wood, but they can be used more subtly to highlight texture like a stain, pop out engraved lettering, and add fine detail to a built-up design. I've even used a fine point Sharpie to "paint" traditional Indian henna tattoo patterns on pen blanks (above). Painting can also produce vivid patterns with cloisonné-style techniques.

Gilding

Applying real metal leaf is a great way to create a big contrast against the surrounding wood, which makes this technique perfect for highlighting incised lettering. The only catch is that the leaf often tears before it can be gotten into the lettering if the recess is very deep, and it can be difficult to get super-crisp edges on very fine details.

Burning

Controlled application of heat to the nearly finished pen can alter its color and texture, adding character and visual interest to the material. One well-known technique is to simply hold a wire to the spinning blank, creating a burned-in line. Careful application of a propane torch can lightly scorch wood, deepening its color, or it can create a crackled effect on some plastic materials. Be careful to avoid breathing the (super-nasty!) fumes produced by scorching or burning any exotic wood, plastic, or anything else, for that matter. The pen on the left (above) is an Inlace Red Pearl blank, which I torched, then highlighted the crackling pattern with dye. I'll eventually use this effect on an Arts and Crafts themed pen to produce the craquelure characteristic of antique ceramic glazes.

Polymer Clay

Some artists are producing blanks by making colorful patterns in polymer clay (Jami Miller, Toni Street), either building it up directly on the brass tube, or wrapping it around the tube like a veneer, then casting the blank around that. Totally beyond my pay grade.

Wire Work and Gemstones

I've played a bit with producing designs by wrapping wire (sterling silver, copper, or brass) around the blank, or drilling holes and running the wire from one hole to the next, which can be used to make a stitching-like

pattern. This can make a pen look more like jewelry, so I've also played with adding beadwork and semi-precious gemstone cabochons or tiny Swarovski crystals to the surface of the finished pen. This can add interesting texture and dimension to the shape of the pen, as well as adding sparkle and fire.

Scrimshaw

Why? Just because you can. It's easy, traditional, and fun!

Carving

Turning is basically carving around an axis, so if you can turn wood, you can carve it too - it just takes a little longer to finish the job. I've seen all kinds of nifty things, from royal crowns to swords to gnomes carved on pens, and if you stick to low relief, you can still use crystal clear polyester casting resin or epoxy to fill over the carving to get a smooth, easy-to-keep-clean surface if you like. Joe Pozzi has some great examples of both carved and scrimshaw pens.

FINISHING THE PEN

On laminated and infill-cast blanks, be careful not to over-sand, because material will be removed faster from softer areas, leaving a "lumpy" pen. Also, while sanding, be careful not to use worn-out sandpaper, which burnishes the wood, potentially leading to delamination of the CA finish.

No Finish

Some woods and other materials (like plastics) need no finish, they only need to be polished and left with a natural finish.

Wax

Not much of a finish, really, but wax does make a great protective coating during assembly, since I usually use a dab of CA to hold the cap / clip assembly in. I don't buff the wax out until the next day, to avoid CA fumes coming out and sticking to fingerprints left on the pen. If I want a CSI-themed pen, then I'll leave off the wax coating.

Woodturners' Polish / Friction Polish

This finish is super-quick and easy, but doesn't last more than about three months in use. The pen is eventually left with a natural, raw look, although enough finish remains in the pores to seal the surface reasonably well. I've noticed that the more expensive brands do seem to work a little better than the cheap ones.

Lacquer

A bit more durable than friction polish, but the finish still comes off after some time. I use lacquer on textured or contoured surfaces that are too rough for a CA finish.

CA Finish

Cyanoacrylate, or superglue, cures into an acrylic coating that, so far, is completely impervious to skin oils, and holds up well for years in use. As an added bonus, it fills small voids and yields a super-high gloss, "wet look" shine, or it can be knocked down to a satin shine by buffing with an appropriate abrasive pad.

Epoxy

By far the most durable, and least easy-to-use finish I've ever used. Epoxy will outlast most hardware plantings, is totally proof against water, skin oils, and all but the harshest solvents, and can get nearly as high a gloss as CA while repelling everyday scratches and scuffs better than anything. The downside? This stuff is very slow, rather messy, and not very forgiving of mistakes, even compared to CA.