

RESTORING A PAIR OF GILDED GIRANDOLES

By Nancy M. Thorn*

This pair of carved and gilded girandoles, early 19th century, American or English, provides an excellent opportunity for observation of carving, joining, and gilding techniques from this period. Girandoles were a common interior furnishing in America and Europe from 1790-1820. Photo documentation of step-by-step treatment procedure included structural repair, replacement of the unstable gesso ground, and finishing treatment in the 19th century manner.

Introduction and History

Water gilding has been the common technique for applying gold leaf to interior furnishings from the Middle Ages to the Industrial Age in Europe and America. This method of gilding is too labor intensive for common use today, but it has never completely died out. Water gilding is still used, mostly in picture frames and in restoration. There have been very few technical changes since Cennino Cennini described the process in his A Craftsman's Handbook, 1390.

The term girandole is French, and originally referred to candle holders, with or without mirrors. Now, girandoles are generally accepted in this country as being mirror frames of the Federal period, Neo-Classical in style. They were not popularized in America or England until the beginning of the 19th century, although they were being produced in England by around 1750.

Girandoles are severe and formal in style. Burnished gold balls or carved rope gleam from deep coves, forming the strong circular shape. Black, reeded liners ring the inside edge. Typical crest motifs can be horses, sea creatures or eagles. The pendants are usually stylized acanthus leaves (sometimes with a fruit drop) and visually support the frame from below and balance the crest. The swags drape and soften between crest and frame. Convex mirrors allow additional reflection from the candles, and of the room itself. Pine, often American, was employed on both sides of the Continent.

A Pair Of Gilded Girandoles, 1820, Condition As Received

When we received these particular girandoles, they were de-laminating. The bodies of the frames were made in sandwiched layers, creating depth for the cove, plus a cap moulding on top. The eagles and swags were also de-laminating at the glue joints. The balls going around the frame inside the cove were attached with wood dowels (3/32"), which had also come loose. The reed liners, which formed the rabbits, and the carvings, were split due to shrinkage. Tips were lost on many of the carvings.

About 35% of the original gesso separated from the wood ground, and there was a small amount of gesso rot, mostly around the open, wood joints. Exposure to excessive moisture causes the rabbit skin glue in the gesso to lose its adhesive qualities, turning the gesso into chalk. Because of the large amount of gesso loss, it was decided that the original gold would not be saved, but we would patch to the solid, original gesso. The original gold was worn, with 60% remaining with good adhesion to the clay beneath it.

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These frames are made of pine. It is not known whether they are English or American, as the general design and structure are typical of both countries. They date from between 1790 and 1810.

The two layers making the frame bodies were lap joined and edge glued in two places for each layer to complete the circular shape.

All joinery was glued with hide glue. The hide glue acted not only as an adhesive, but also as a gap filler. These structural members were probably pressure fit and not clamped.

The original gesso was the traditional rabbit skin glue and amorphous calcium carbonate, and forms a 1/32" - 1/16" finish. There was no protective coating over the gold, typical of gilt interior furnishings.

There were also some old repairs to be dealt with. In this case, the repair gesso fills were lapping over the original gold; a poor bond at best. They were lifting away from the wood due to shrinkage of the support, or for improperly prepared primer coat of gesso, necessary for a strong mechanical bond. Bronze powder paint had been applied to the eagles to camouflage gesso losses. This paint was removed with a commercial chemical stripper, which does not attack a water soluble surface.

Treatment

Treatment procedure began with repair of the structural elements of the frames. The de-laminated areas were separated, and the old hide glue removed with warm water and some scraping tools. The old, brittle glue returns to a gel-like consistency fairly quickly, and can be removed without actually soaking the wood fiber. Hide glue was decided on as the adhesive for re-joining. All pieces were clamped in place with varying degrees of tension to reregister to the old, sound gesso on the sides of the frames, and to correct warpage. The wood members to be re-joined were warmed for better penetration of the glue. Wedge-shaped shims were glued into the gaps, completing the circular framework. Splits in the carvings and reeded liners were re-glued or filled with a 50/50 mixture of Hydracal (non-shrinking builders plaster) and Elmer's yellow carpenter's glue.

Missing pieces from the tips of the swags and eagle wings were replaced with new, carved pieces or formed from epoxy putty.

Gesso

After the frames were structurally sound and complete again, we attacked the gesso problems with long sighs and knowledge of the tedious hours to be spent in this area.

Since it was decided to keep as much of the original gesso as possible, the first step was to pick the loose and crumbling gesso. My favorite tool for this procedure "is a quilling knife. The blade is fairly short and stout, coming to a blunt point. The balls had already lost 50% of their gesso, so we stripped them of the remaining by placing them in damp sawdust overnight. The gesso then peels off the wood in large rubbery pieces without saturating the wood. : After removing the unsound gesso, 50% of the original was remaining, with the majority of it in the coves, sides of the frames, and the bottom pendants.

Gesso Recipe

Our standard gesso recipe is: 1 ounce granulated French rabbit skin glue, soaked in 4 fluid ounces distilled water, then heated until liquid. 2/3 of this warm glue is combined with amorphous calcium carbonate, (non-crystalline) to which 4 fluid ounces of distilled water have been added, to make a thick mounding mass.

Gesso Application

All raw wood areas were primed with a thin, half water, half gesso (warmed) solution. The original gesso was up to 1/16" in thickness, and the losses were filled to level by brush in about seven coats. These new fills were smoothed and shaped with 120 sandpaper, leaving tooth for the spray coats to follow on the frame bodies. Since old gesso can become too hard and brittle for a good burnish, five spray coats of gesso thinned with water, 1 to 4, were applied to the frames. This surface, of a consistent density, makes a more even burnish than if the new gesso had been left patched up to the old gesso. It is risky to apply strong over weaker gesso, as shrinkage pulls the weaker gesso off the support. I have seen quite a few frames completely re-gessoed over old, and surprisingly, the two layers do not generally separate under normal conditions. I have seen three layers of gesso, clay and even gold, with the last repair being over 60 years old and having no separation problems.

Final leveling and smoothing was done with a succession of paper, beginning with 220 open coat and finishing with 400. A boar's hair brush, dipped in warm water, cleaned up the carvings. The 32 balls were surfaced in a drill at low speed. Care was taken to not put a polish on the gesso in final surfacing. The tops of the reeds in the liners were also gessoed as they had been flattened in previous repairs. At this point, the frames and all parts were wiped down with alcohol to remove gesso dust and to expose pinholes.

It's an ongoing battle to prevent pinholes from developing either in the gesso stock, or after application to the frame. Environmental conditions--too cool or damp--or not wetting the raw surface well enough, can cause pinholes. Surface tension keeps them trapped in the stock, and wetting agents, such as ox gall, help them to rise and release. Overheating or applying too cool also causes pinholes.

If pinholes occur, against all precautions, they can be filled with a sludge of thinned gesso, and surfaced. Carved details are replaced in the new gesso and all areas are ready to receive gilder's clay.

Clay

Clay is a native material--aluminum silicate and ferric hydroxide--and ranges in color from brownish red to slate gray. Historically, most American and English frames were clayed in cooler grays, while other European countries favored the warmer colors. The brilliance of the burnished gold or silver is affected by the color under it; either warmer or cooler. Ochre clays are common universally for the matte areas to hide breaks in the gold.

Modern clays for gilding come in lump and paste forms, and contain additives such as aniline dyes, lanolin or glycerin, and preservatives. The exact ingredients are not made available by commercial manufacturers by tradition, but I have experimented with my own formulas, using clay from the Columbia River, the St. Lawrence River, and from the desert floor of Death Valley, with encouraging results.

Research in this area interests me a great deal.

Although the original clay in the matte areas of the girandoles was pink, we decided to use ochre, and a dark gray for the burnished areas.

Clay Formula

Le Franc's lump clay was ground over a steel screen to make a powder which was then mixed into paste and pushed through a fine, brass mesh. When making larger amounts, the lumps are broken up and put into an agate tumbler with distilled water and ground for 24 hours.

The clay mixture is further thinned with distilled water until it drips off a #7 red sable brush in a single drop. Rabbit skin glue is added at this point.

The same 1 to 4 glue formula for gesso is heated and added very slowly to the clay-water mixture while stirring continually. The clay thickens noticeably, and almost immediately. The glue is added until the clay again comes off in a single drop; then the glue, water, and clay ratio is correct. Each batch of clay is tested in a small area of the object, and adjusted for the hardness of the gesso, adhesion, burnishing capabilities, and color.

Clay Application

The ochre clay is brushed on warm over the newly gessoed areas of the frames and ornaments. After four ochre coats, four coats of gray clay were brushed onto the areas to be burnished, and the ochre clay was given a thin gelatin and water solution to ensure good adhesion with the gold leaf. Each area to receive gold is first wet thoroughly with distilled water just before the gold is laid. The glue in the clay is reactivated and the water pulls the gold down onto the clayed surface and soaks into the gesso, softening it. When the matte areas are surface dry, they are burnished with cotton, removing the shewings and pressing the gold into the still soft gesso.

The gesso in the burnish areas needs to be almost dry before it can be polished with the agate, without tearing through the gold.

Gold

We used 22K German, double-thick gold for these frames. The coolness of this gold was compensated for in the final glazes. It was necessary, as always in restoration, to be conscious at each treatment stage that the fills must finally match the existing finish. Even after the original surface has been cleaned, it has darkened slightly due to the extra karat or two {either copper and/or silver} oxidizing.

Up until the Industrial Age, water gilt items were rarely given a protective, clear finish, although rabbit skin glue was sometimes used, whether to further dull the matte areas, or to protect the frame, is unclear. Rabbit skin glue glazes darken and dull with time and are very difficult to remove.

The gold is cut in the book, with padding and support between the bottom two pages. The gold is transferred to the frame with a squirrel hair gilders tip, which is lubricated with chapstick rubbed onto my wrist.

When the entire frame and ornaments are gilded and patched, the matte areas are cottoned off and we are ready to burnish.

The familiar crook shaped agates in two different sizes are sufficient for most jobs. Cennino Cennini mentions the use of the teeth of flesh-eating animals, down to cats' teeth in [A Craftsman's Handbook](#). I use a lipstick shaped hematite burnisher on flats, and a finely pointed agate for detailed carvings.

During the burnishing process, the gesso layers compress and harden while the clay polishes to a mirror finish, which the gold reflects. Cennini wrote: "When shall you know that it is burnished properly? The gold then becomes dark from its own brilliance." There are as many different treatment solutions for matching new gold to old as there are pieces. Always a new challenge. In this case, the original gold finish, after cleaning, had darkened, and was slightly worn, exposing the color of the clay, and the double areas of gold in the overlaps.

Finishing

We chose a solution of Japan colors, thinned out with mineral spirits for a wash coat. Raw umber, white, and black brought the new 22K gold leaf to the aged and darkened original 23K. This solution evaporates fairly quickly and so it is padded on. The mildly abrasive quality of the pigment wears the new gold. There is more contrast between the burnish and matte areas after glazing, which has the effect of defining the frame. The balls in the cove darken but don't lose the brightness of the burnish, and the luster of the shadowed cove reflects light rays from each ball.

The Japan glaze is sealed with gold lacquer, sometimes called alcohol gold. It is really a type of very clear shellac, traditionally used to tone silver leaf to appear to be 10K, 16K, or 23K gold. The liner was repainted black with pigmented shellac, and steelwooled.

Assembly

Assembly of the two frames was a simple matter. The ornaments are flush with the backs of the frames and brass f: plates were fashioned and attached to the ornaments and screwed onto the frame bodies. The balls were spot glued into the holes in the cove.

It is not known whether the ¼" plate, beveled mirrors are original to the frames, although they are old. They were installed into the frames and centered with the original wedge-shaped wood spacers attached to the rabbit.

Conclusion and Comments

These frames represented many of the restoration problems typical of gilded wood objects. For the restorer, the challenge lies in making the piece structurally sound and whole while respecting the original visual intent. If the gesso loss is significant, stripping the gesso to the wood or patching and completely re-gilding can be the most practical treatment.

In the past few years there has been a renewed interest in gilding and period picture frames.

Museums such as the National Gallery in Washington, D.C., and the Metropolitan in New York, have begun extensive programs to restore period paintings to frames from the same era. Object and painting collectors are investing in restoration, with new appreciation for the aesthetic and monetary value of their collections. Water gilding in the contemporary furniture and picture frame market has become better understood and appreciated. Fine furniture makers are incorporating gilded detailing and ornamental elements in their designs, and modern picture frame mouldings are being produced increasingly in burnish gold and partial gilt, here and abroad.

Information on all aspects of gilding has become much more available in the past 20 years, through conservation groups, books, and renewed interest.

This free exchange of information between conservators, the public, art institutions, and picture framers, helps to ensure continuation of an ancient living craft, and proper care of existing gilded objects.

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