

Patents | Edmund L. Andrews

Artistic Etching Without Using Acids

Working from the premise that the effects of many chemical reactions can be achieved through electricity instead, a professional artist and her husband have invented a way to etch images onto metal plates without using dangerous acids.

Etching pictures on metal plates, which are then used to reproduce the images on paper, is a centuries-old craft that has advanced considerably for large, industrial purposes but relatively little for small-scale artists. Typically, it entails coating a plate of zinc, brass or copper with a waxy material, then carving an image in this coating with assorted tools. The plate is then submerged in an acid solution, which eats into the metal wherever the coating has been cut away.

But the etching chemicals are dangerous to handle and some of the resins used to create shading can get into an artist's lungs, said Omri M. Behr, a patent attorney who was one of the inventors.

To avoid that problem, he and his wife, Marion, developed a system in which plates are submerged in a solution of water and metal ions. The plate being etched is connected to the positive electrode of an electrical source, while a similar plate is submerged and connected to a negative electrode. When voltage is applied, metal ions are pulled from the plate being etched through the solution and deposited on the other plate. Over time, anywhere from a few minutes to a few hours, the process begins to cut visibly into the metal where the artist has cut away the wax.

Mr. Behr said the basic idea has been around for years, but had been considered dangerous because electrical pressure greater than two volts can sometimes ignite an explosive reaction between hydrogen and oxygen. But the new technique gets by with less than two volts by using a particular blend, he said.

They received patent 5,102,520.