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[Continued on next page]

(54) Title: METALLIC MATERIALS WITH EMBEDDED LUMINESCENT PARTICLES

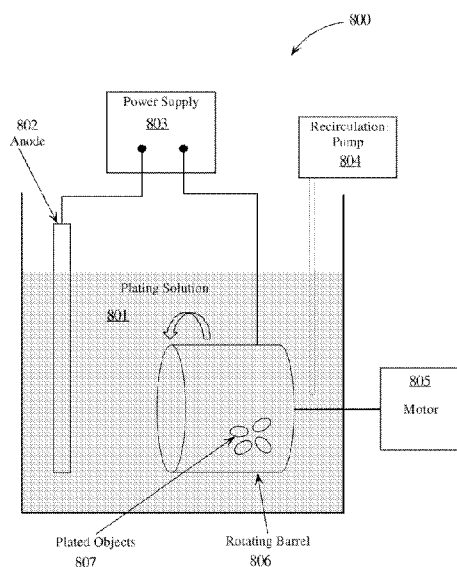


FIG. 8

(57) Abstract: Formation of an authentication element by deposition of a metal layer with embedded particles on a metal substrate, wherein the embedded particles are configured to convert energy from one wavelength to another. The embedded particles may be upconverters, downconverters, or phosphorescent phosphors, which can be detected and measured with analytical equipment when deposited in the metal layer. A metal substrate may include coinage.



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