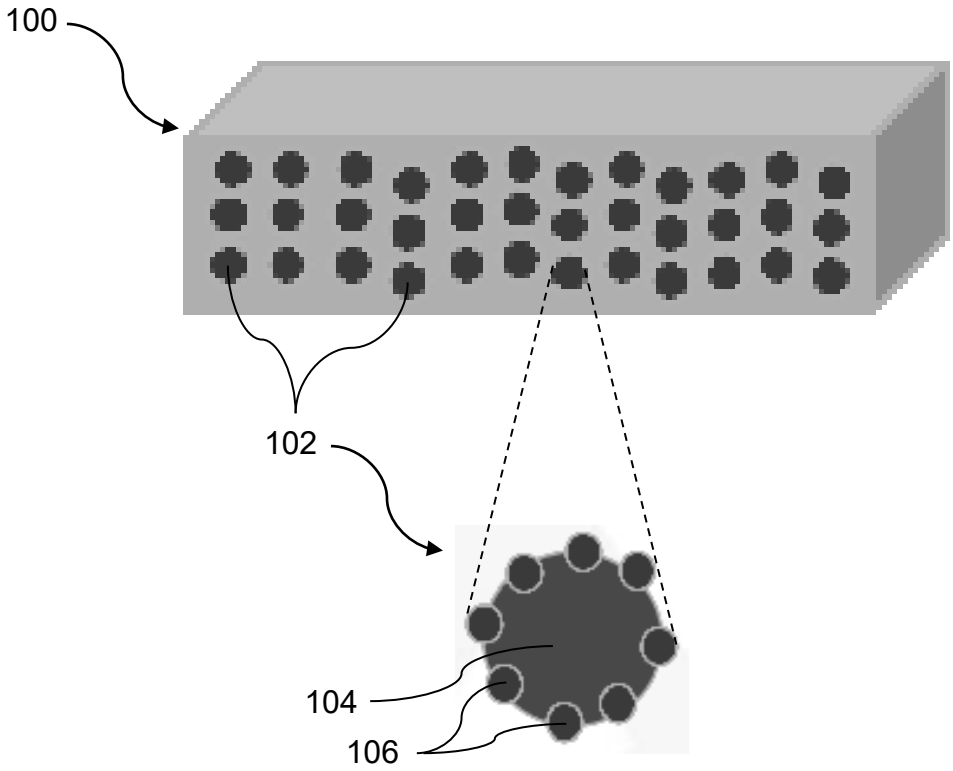


Figure 1A

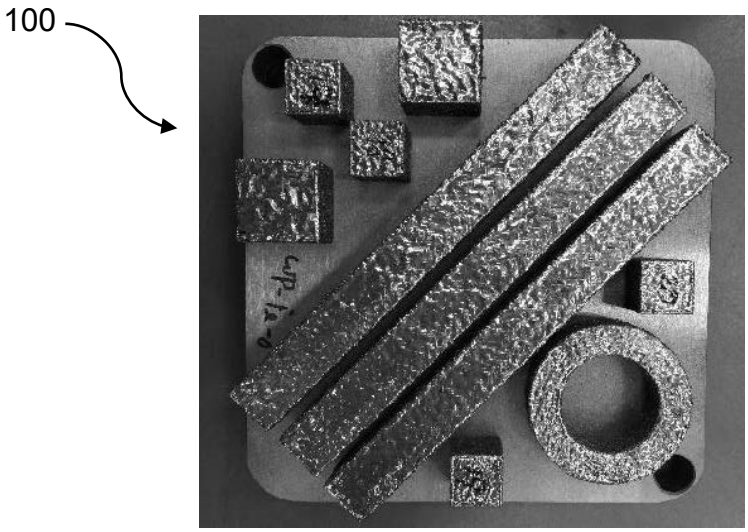


Figure 1B

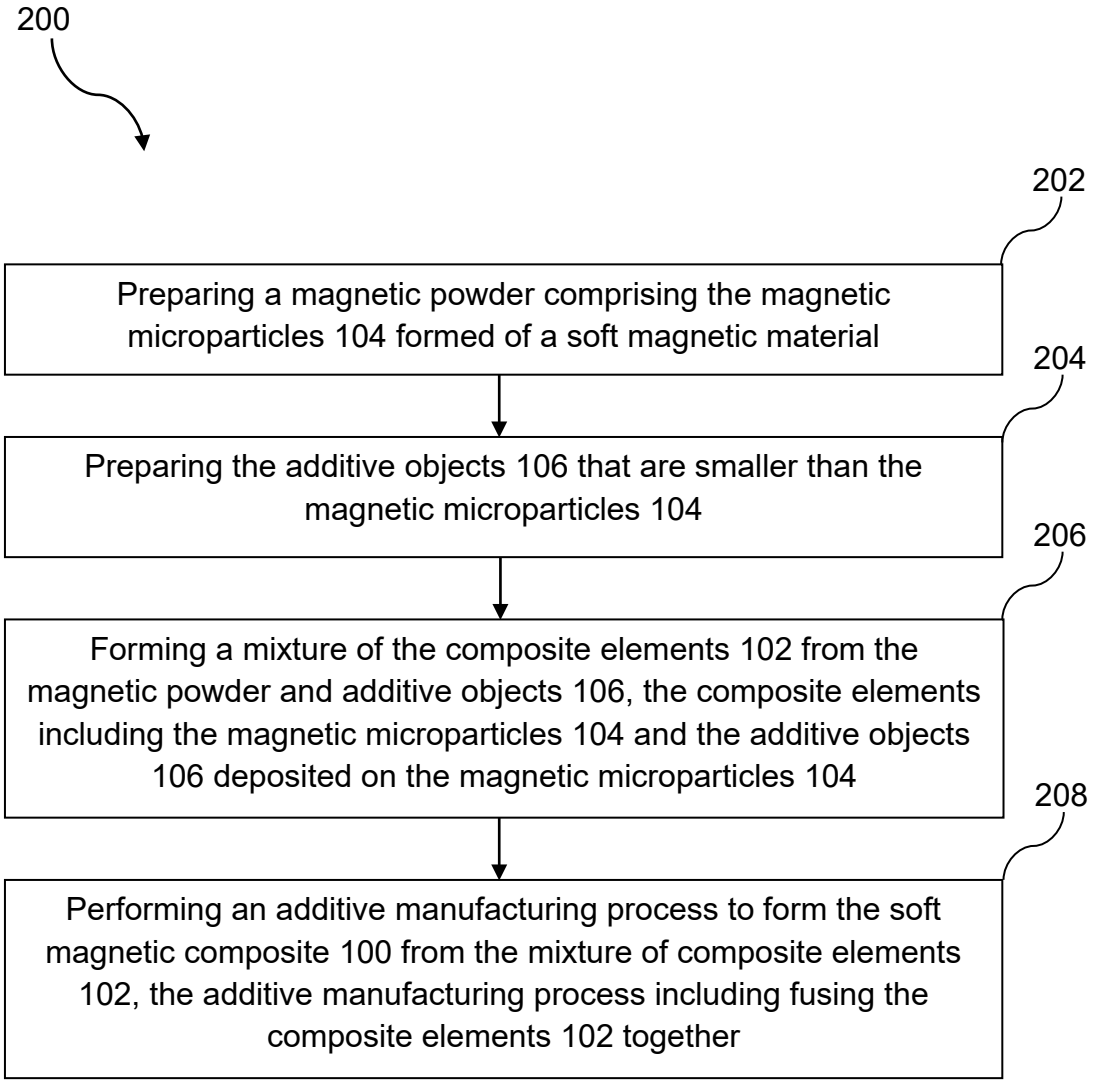

200
202
Preparing a magnetic powder comprising the magnetic microparticles 104 formed of a soft magnetic material
204
Preparing the additive objects 106 that are smaller than the magnetic microparticles 104
206
Forming a mixture of the composite elements 102 from the magnetic powder and additive objects 106, the composite elements including the magnetic microparticles 104 and the additive objects 106 deposited on the magnetic microparticles 104
208
Performing an additive manufacturing process to form the soft magnetic composite 100 from the mixture of composite elements 102, the additive manufacturing process including fusing the composite elements 102 together

Figure 2



Figure 3

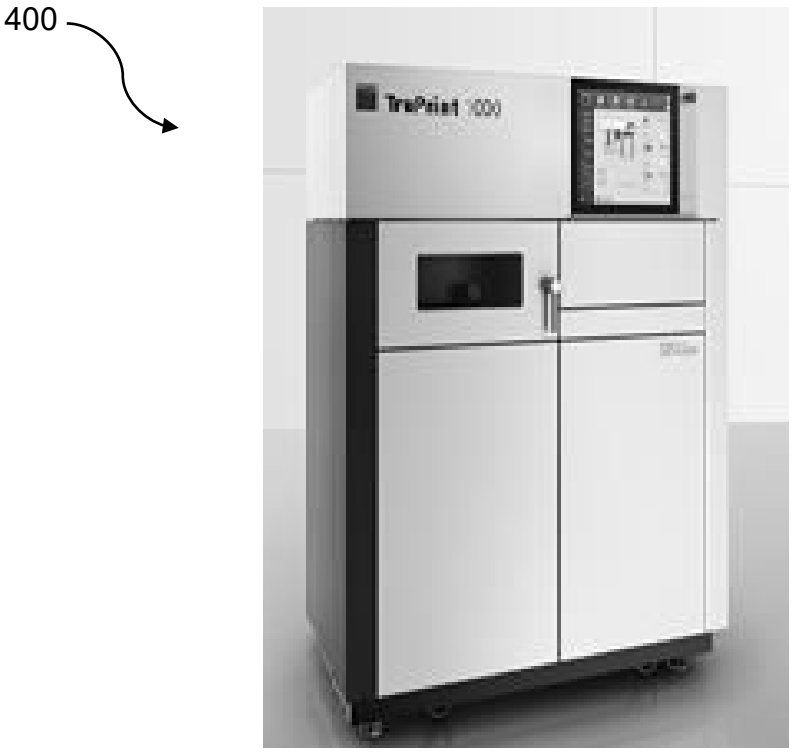


Figure 4

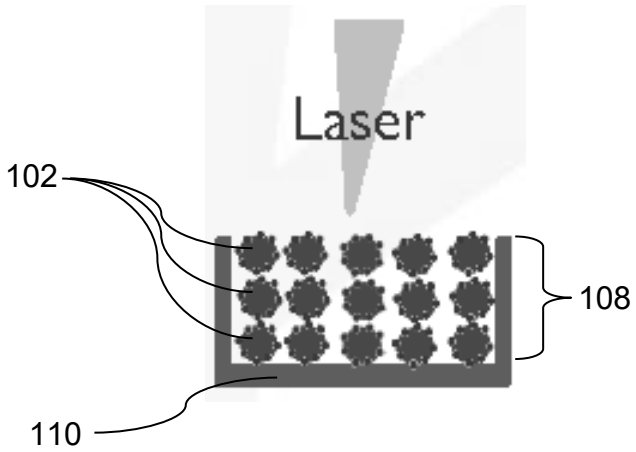


Figure 5A

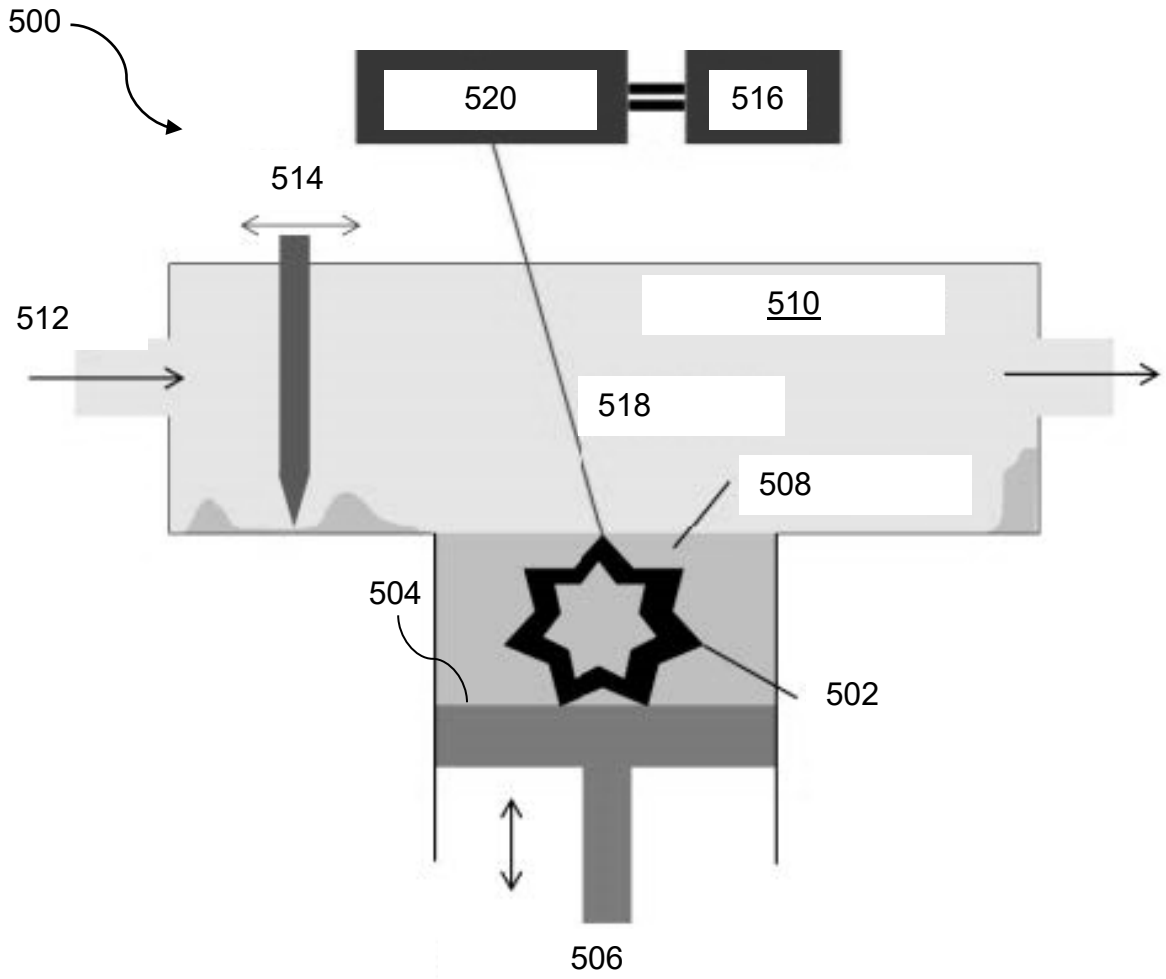


Figure 5B

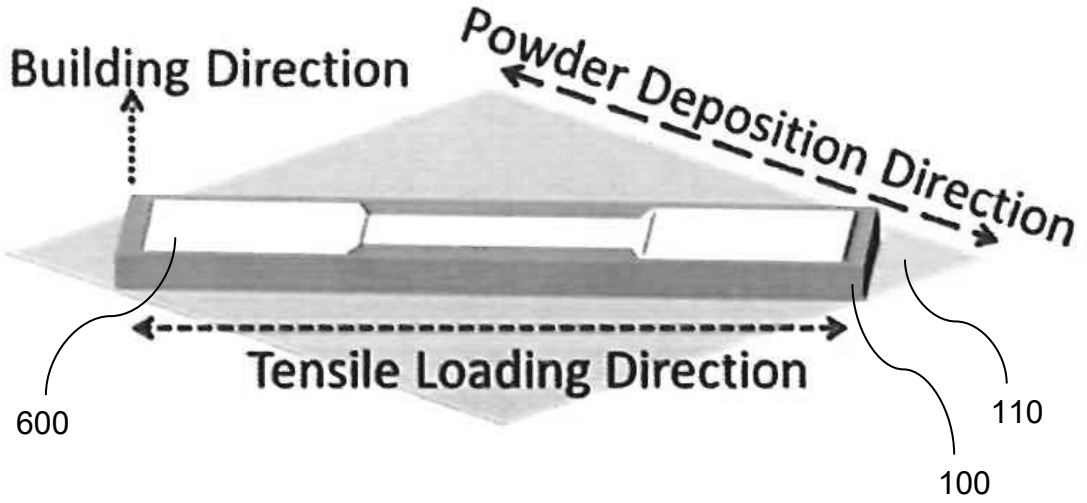


Figure 6A

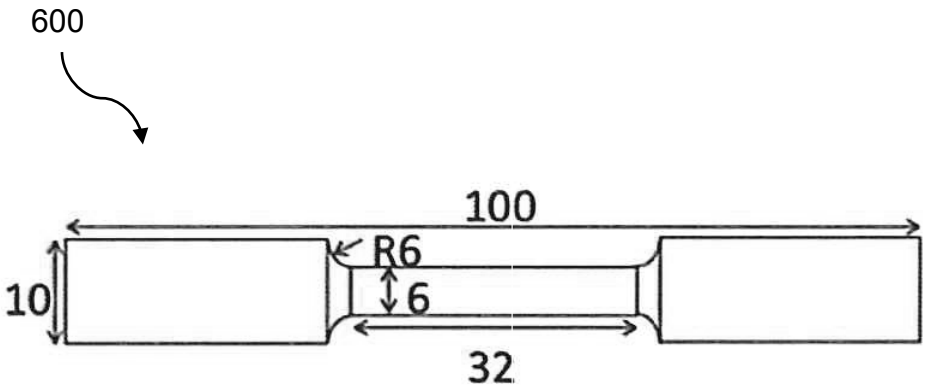
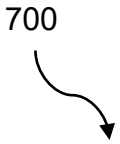


Figure 6B



Test Coupon	Tensile Properties			Magnetic Properties		
	Ultimate Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Magnetic Saturation (T)	Magnetic Coercivity (Oe)	Curie Temperature (°C)
Wrought FeCo	302.9	250.0	5.0	2.40	1.88	980
Sintered FeCo	575.0	510.0	3.7	2.35	6.28	720
LAAM-FeCo	792.0 ± 10.6	563.3 ± 8.0	14.9 ± 3.4	2.33	17	731
TiC-FeCo	911.0 ± 3.1	738.7 ± 3.6	17.8 ± 0.1	2.32	25	731
Alumina-FeCo	765.3 ± 50.3	542.4 ± 20.9	7.1 ± 2.4	2.31	17	731
CNT-FeCo	863.5 ± 15.2	714.9 ± 11.4	13.2 ± 2.0	2.41	15	731

Figure 7A

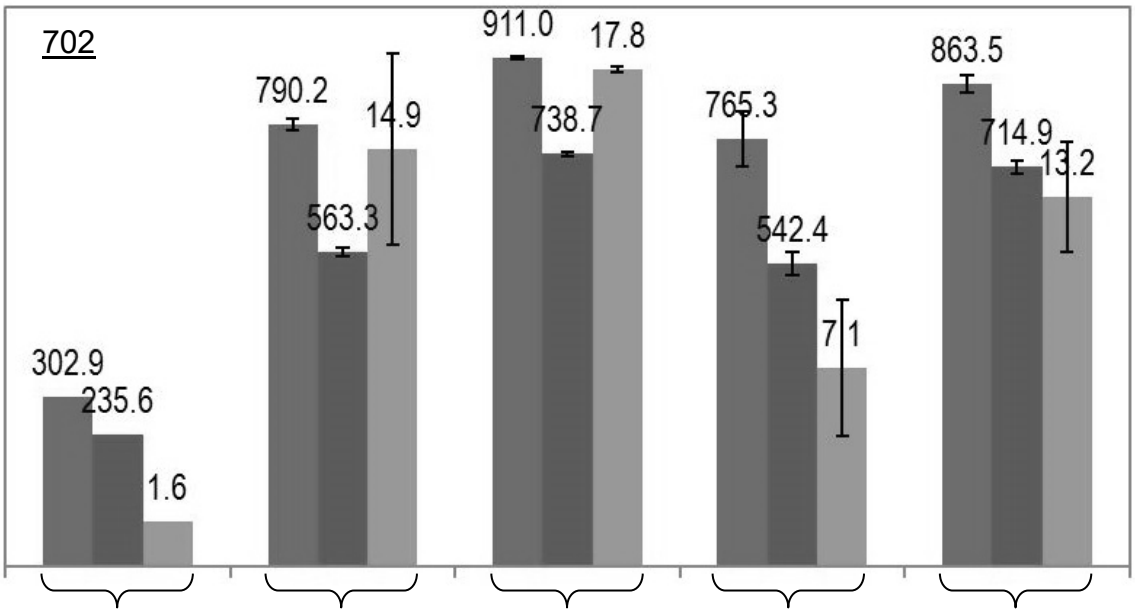


Figure 7B

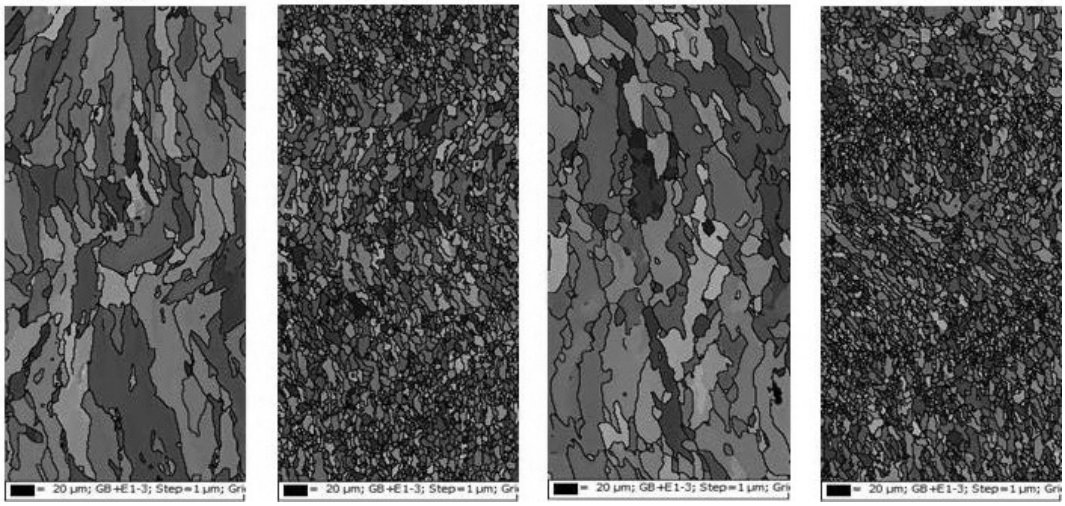


Figure 7C

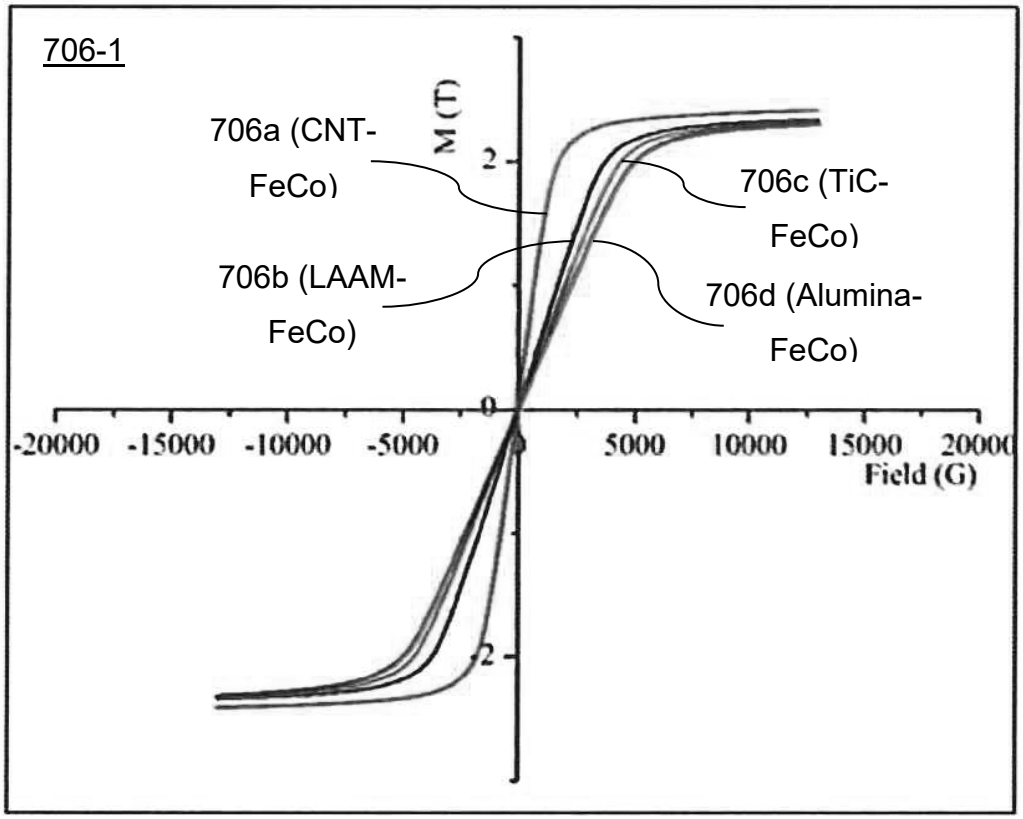


Figure 7D

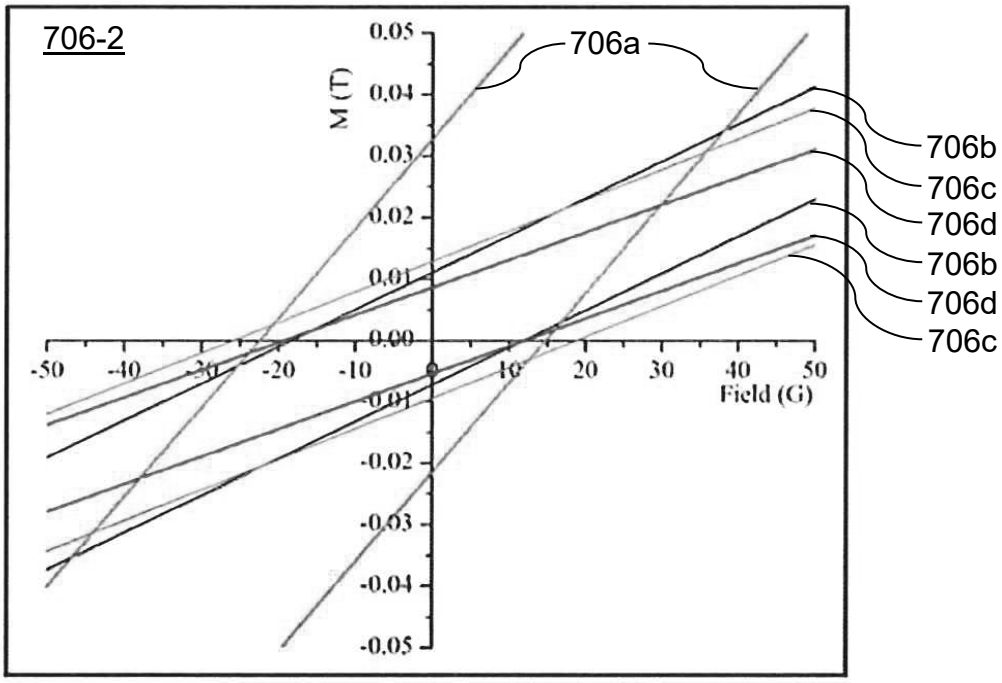


Figure 7E

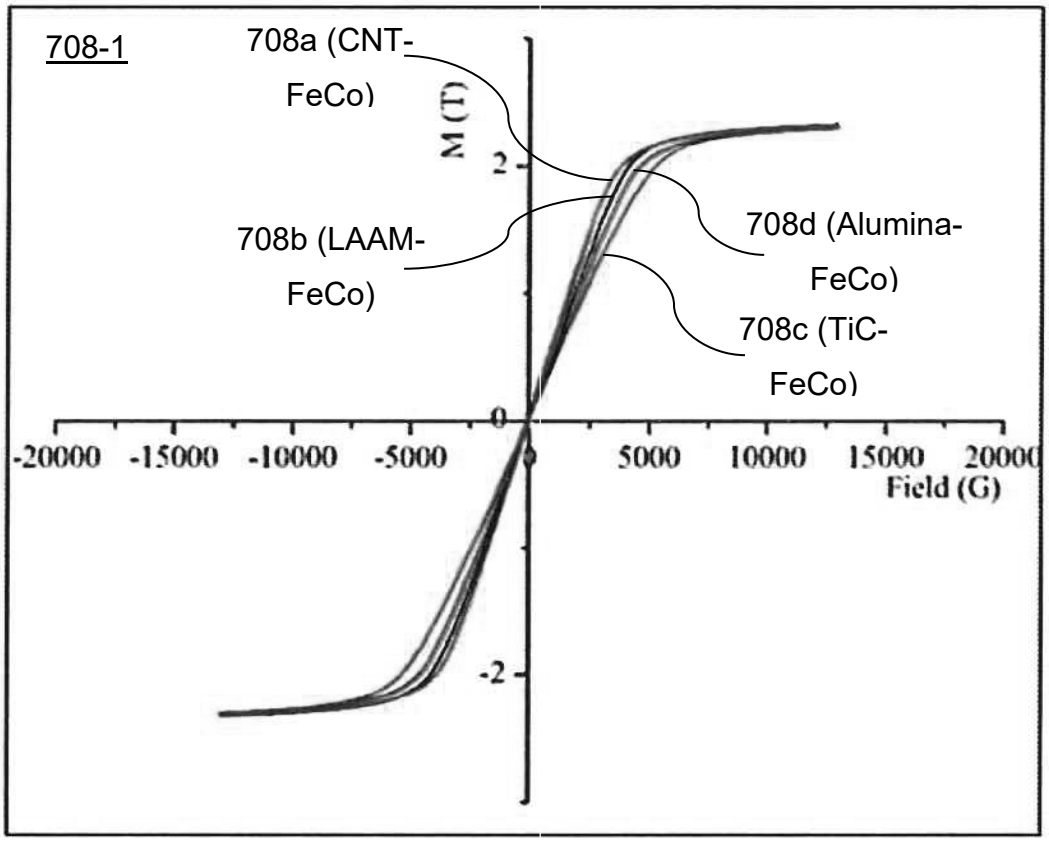


Figure 7F

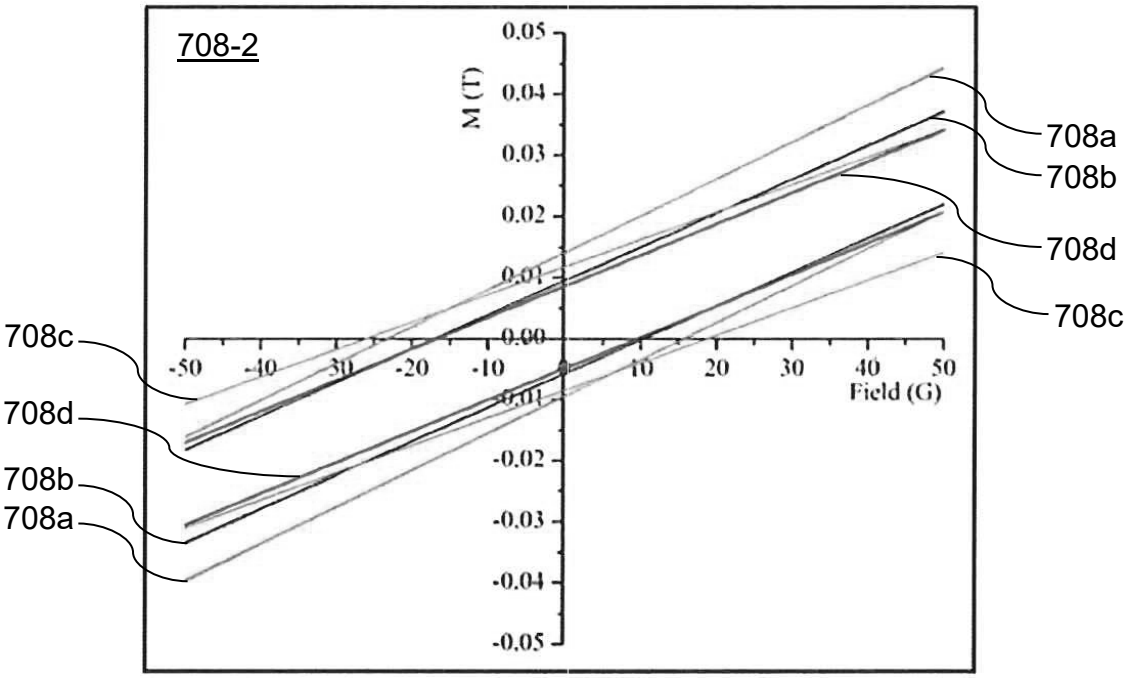


Figure 7G