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Magnetic Particle Separator

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Abstract: The magnetic particle separator uses an induced magnetic field to separate magnetic particles held in solution by magnetophoresis. The magnetic particles may be, for example, inherently paramagnetic or superparamagnetic, may be magnetically tagged or the like. First and second magnetic particles initially flow along a longitudinal direction. An external magnetic field along a lateral direction, orthogonal (or near orthogonal) to the longitudinal direction, is applied to an externally magnetizable wire, which extends along a transverse direction orthogonal to both the longitudinal and lateral directions. The external magnetic field generates an induced magnetic field in the externally magnetizable wire, and the induced magnetic field generates repulsive magnetic force on the first and second magnetic particles. Due to differing magnetic susceptibility, size and/or mass between the first and second magnetic particles, they are separated by following separate paths generated by the respective magnetic forces thereon.