USPTO Provisional Electromagnetic Decoupler application. This summary highlights how this AI-governed electromagnetic decoupling matrix provides cross-industry kinetic safety and cryptographic logging across maritime, aerospace, automotive, and industrial sectors.

Electromagnetic Decoupler: Provisional Patent Summary

The Technical Problem

- Current kinetic safety systems across maritime, aerospace, automotive, and industrial sectors rely fundamentally on friction-based resistance, static mechanical linkages, reactive destruction, or are entirely non-existent.
- In aerospace, bird strikes cause catastrophic engine failure because fan blades are under maximum rotational torque upon impact, resulting in cascading blade shattering.
- In maritime applications, propellers lack dynamic disengagement, causing catastrophic rotational lacerations to submerged hazards or biological entities under full engine torque, while abruptly cutting power at high speeds induces dangerous bow-diving.
- State-of-the-art industrial saw safety mechanisms require physical biological contact—literally cutting the operator—before triggering a pyrotechnic, destructive braking action that destroys the machinery and cannot scale to high-inertia applications.

The Omni-Domain Kinetic Decoupling Solution

- **Predictive Multi-Spectral Sensor Array:** The system utilizes omni-directional sensor nodes (Sonar for water; LIDAR, Radar, and Computer Vision for road and air) to calculate a dynamic "Predictive Threat Horizon" based on velocity vectors.
- **Electromagnetic Decoupling Matrix:** An electromagnetic clutch instantly severs the rotational kinetic link between the powerplant and propulsion/machining output in milliseconds, neutralizing kinetic energy prior to impact to reduce complex trauma or structural failure to simple translational deflection.
- **Proportional Micro-Slippage & Anti-Dive Protocol:** For high-velocity transit, the logic controller pulses the electromagnetic clutch to generate graduated drag, safely decelerating mass without causing violent forward or side-to-side pitching.
- **ECU Anti-Rev Trap & Audible Warning:** Synchronized with clutch disengagement, a parallel signal to the ECU or FADEC instantly retards ignition timing to prevent the unloaded powerplant from over-revving, while a distinct 2-second high-decibel auditory pulse warns human subjects.

- **Autonomous Re-Engagement Loop:** Sensors continuously track hazards, and the exact millisecond the perimeter is clear, the system automatically matches shaft velocity to powerplant RPM and re-engages full thrust.

Industrial Expansion & Competitive Advantage

- **Versus SawStop:** Unlike reactive capacitive-touch brakes that require skin contact and destroy the blade via pyrotechnics, the system uses predictive vision to create a virtual 3D perimeter around the blade. It decouples the motor *pre-contact*, enabling non-destructive braking that scales effortlessly from a 7-inch skill saw to a massive industrial timber mill.
- **Cross-Industry Scalability:** The architecture provides universal safety utility across conveyor belts and pinch points, industrial mixers and compacting augers, robotic manufacturing arms, agricultural PTO shafts, and domestic high-speed laundry centrifuges.

Decentralized Telemetry & Verification

- **Gated Operational Override (GOO):** An intelligent fail-safe layer that evaluates secondary contextual telemetry and mission-critical continuity requirements to determine if a decoupling event should be delayed or bypassed.
- **Jamatcha Protocol & Ethical IP Integration:** Every kinetic event is cryptographically logged as spatial telemetry, authenticated via a human-in-the-loop verification protocol (Jamatcha), and minted to the Ethical IP global ledger for decentralized safety analytics and global licensing.

This summary highlights the multi-industry scope and predictive safety mechanics of the updated Electromagnetic Decoupler provisional application. L