

Warp Factor e-Whistle: Provisional Patent Summary

The Technical Problem

- High-stakes sporting events rely on human-operated timing systems, where the inherent latency between an official recognizing an event, blowing a whistle, and a timekeeper stopping a clock often results in losing 1.5 seconds or more of game-time.
- Prior electronic timing solutions (such as whistle-listening mic packs) are not self-contained, are highly susceptible to crowd noise interference, and fail to address athlete inclusion.
- Deaf and hard-of-hearing (D. & H.H.) athletes remain severely disadvantaged, relying on archaic visual cues or drum vibrations to initiate or halt play.

The Warp Factor Architecture & Solutions

- **Self-Contained MEMS Pressure Transducer:** Places a micro-electromechanical pressure transducer inside a standard sports whistle to measure dynamic air pressure changes (<1 Pa at up to 1 kHz) created by human breath, ensuring a verified human action that prevents crowd spoofing.
- **Simultaneous Triple-Action Trigger:** A single verified blow accomplishes three actions: halting the master scoreboard clock within 1/10,000th of a second, transmitting zero-latency haptic feedback to localized transceiver nodes worn by D. & H.H. athletes, and logging the whistle-blow as a cryptographically verified game-state event into the APE-X.ai ecosystem.
- **Acoustic-Parity Algorithm & Time-of-Flight (ToF):** Because electronic signals travel at light speed while soundwaves travel at approximately 343 m/s, the software uses UWB spatial awareness to calculate the exact distance between the referee and the athlete, dynamically buffering the haptic vibration so it reaches the athlete's skin at the precise microsecond the acoustic wavefront reaches hearing athletes.
- **High-Pressure Pneumatic Threshold:** To prevent false positives from idle mouth-holding or ambient noise, the internal sensor analyzes airflow velocity to distinguish between ambient pulmonary respiration and a forceful, deliberate pneumatic expulsion.
- **Industrial & Civil Embodiments:** Operates as a universal human-to-machine interface (HMI), functioning as a heavy industrial "Smart Dead-Man Switch" to instantly halt autonomous machinery via encrypted UWB mesh, or as a municipal override tool for emergency responders.

Representative Claims Overview

- **Claim 1:** A self-contained officiating device comprising an internal pressure transducer capable of detecting human breath variations, coupled with an encrypted transmitter designed to instantaneously halt remote timing systems and actuate remote haptic wearables.

- **Claim 2 & 5:** A method and system for synchronizing gameplay for hearing-impaired individuals using Time-of-Flight (ToF) calculations and UWB telemetry to delay haptic motor actuation to match the acoustic propagation of the whistle.
- **Claim 3:** An ad-hoc "swarm" networking protocol wherein body-worn vibrator units relay encrypted biometric trigger data to ensure total field coverage and eliminate transmission dead zones.
- **Claim 7:** An anti-spoofing biometric validation method utilizing a MEMS pressure transducer calibrated with a high-pressure pneumatic threshold to reject idle holding and crowd noise while permitting standard acoustic whistle generation.
- **Claim 8 & 9:** Integration of the authenticated trigger as a secure API node transmitting zero-latency game-state commands to venue scoreboards, betting clearinghouses, and industrial E-stop circuits.

This summary encapsulates the latency-free, inclusive, and telemetry-driven architecture of the Warp Factor e-Whistle.