LICENSING OPPORTUNITY: NEXT-GEN LASER RADAR (LIDAR) FOR HIGH-ACCURACY APPLICATIONS

DESCRIPTION

Problem

Traditional LIDAR systems can struggle with accuracy, especially when there are reflections from other surfaces. They also have trouble measuring very small changes in distance. This invention solves those problems by using optical frequency combs, which allow for both coarse and fine distance measurements. It reduces errors caused by noise or interference. The result is a much more reliable and precise way to measure distances.

Invention

This invention is a new kind of laser radar (LIDAR) that uses two special lasers called femtosecond fiber lasers. One laser sends out a signal and the other helps detect the signal that bounces back from a target. It combines two types of measurements—time-of-flight and interferometry—to measure distances very accurately. It can measure with precision as fine as 5 nanometers. The system also works well even when there are unwanted reflections.

BENEFITS

Potential Commercial Applications

This technology could be used in self-driving cars for better navigation and obstacle detection. It can help in construction and surveying by providing super-accurate distance measurements. It's useful in aerospace for docking spacecraft or guiding drones. It could also be used in manufacturing for quality control and precision alignment. Even scientific research labs could use it for experiments that need exact measurements.

- Autonomous vehicle industry
- Aerospace and defense
- Construction and civil engineering
- Advanced manufacturing and robotics
- Scientific instrumentation and research labs

Competitive Advantage

1. Reduced Operational Costs: The system's nanometer-level accuracy could reduce the need for frequent recalibration, trimming down maintenance expenses in manufacturing and aerospace settings.
2. Lower Integration Costs: By combining coarse and fine measurements into one device, the need for multiple sensor systems is eliminated—this simplifies setup and lowers procurement and installation costs.
3. Fewer Product Defects and Returns: Higher measurement precision means tighter quality control, leading to fewer defects. That translates into reduced waste, rework, and return rates, which can save manufacturers 15–30% in scrap-related losses.
4. Expanded Market Reach: With the ability to operate in noisy, complex environments, the system is adaptable to sectors that traditionally avoided laser-based metrology—opening new revenue streams in infrastructure, construction, and even medical devices.
5. Scalability with Compact Design: The use of fiber lasers allows for a more compact and potentially mass-producible unit, which lowers manufacturing costs and increases the potential for widespread adoption in consumer-level products.

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