Technology Offer CSIC/IG/169

Anti-counterfeiting Inks with Embedded Microchips

Versatile method to produce fully customizable microchips that can be embedded in a wide range of ink formulations, including conventional writing and printing inks and industrial and security-grade coatings, enabling advanced anticounterfeiting functionalities across diverse materials.

Intellectual Property

PCT Patent application filed

Intended Collaboration

Licensing and/or co-development

Stage of development

TRL3

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Market need

The growing sophistication of counterfeiters is driving a rise in the falsification of products, packaging, and official documents across sectors such as luxury goods, pharmaceuticals, electronics, and public administration. Current security solutions—primarily based on optical effects or chemical markers—are increasingly vulnerable, as they can be imitated with advanced imaging and printing tools. This situation highlights the urgent need for authentication technologies that offer unique, unclonable identifiers beyond the reach of conventional reproduction techniques. Industries are therefore seeking robust, invisible, and rapidly verifiable security features that integrate seamlessly into existing production and printing processes.

Proposed solution

Novel anticounterfeiting approach based on fully customizable microchips engineered with specific shapes and functional characteristics. These microchips can be dispersed and embedded into virtually any type of ink—from high-volume commercial printer inks to highly specialized security formulations—allowing easy adoption across a wide range of applications.

Each chip can store unique, optically readable information, enabling secure authentication and item-level traceability that cannot be replicated using traditional methods. The entire solution is designed to be compatible with current industrial printing and marking workflows, enabling straightforward implementation without the need for new machinery or major process changes.

Competitive advantages

- Customizable microchip design.
- Easy integration into inks, making it versatile for invisible application on documents, packaging,or products, without altering their appearance or production process.
- Scalable manufacturing process compatible with a wide range of functional inks, allowing for industrial adoption in multiple markets.
- Manufacturing suitable for clean rooms with difficult access to be reproduced by third parties.