Breath Activated Images and Anti-Counterfeit Tags on Nanopillars

Technology #5926

Anti-counterfeiting measures, such as radio frequency identification (RFID) tags and holograms, are used for many different products and markets, ranging from pharmaceutical goods to high fashion items. According to the National Association of Boards of Pharmacy, counterfeit drugs were estimated to generate $75 billion in 2010 alone, representing a direct loss for pharmaceutical companies, as well as a public safety threat due to the use of potentially substandard drugs. Counterfeit consumer goods make up 5 to 7% of world trade. Multiple estimates place the revenue of this illicit market between $200 and $600 billion dollars per year. Counterfeit electronic parts have even made their way into devices used by the US Navy and US Army.

It has become increasingly necessary to authenticate items to stop the illicit trade of counterfeited goods such as medicines, electronics, high fashion clothes and accessories, and to prevent public health and even national security issues. The anti-counterfeit measures market revenue is expected to grow from $46.4 billion in 2007 to $79.3 billion in 2014, driven primarily by radio frequency identification (RFID) and near field communication (NFC) technologies.

Existing anti-counterfeit measures rely on technologies that are becoming increasingly easy to duplicate (holograms, specialized inks) or that need special detectors to be read (RFID tags, NFC tags, quickread 2D barcodes). Devices that require special detection methods are themselves susceptible to hacking by third parties. Thus, there is a need for high-tech anti-counterfeit tags that are simple and difficult to forge, yet are easily and safely read by the consumer.

Easily authenticable, nanofabricated anti-counterfeit tags

Researchers at the University of Michigan have developed a new anti-counterfeiting technology relying on well known, robust, yet difficult to reproduce nanotech methods that address existing challenges in the anti-counterfeit measures market. Implementing a novel manufacturing approach, these anti-counterfeit tags would be produced in facilities with sophisticated instruments, yet at relative low cost and large scale. Authentication of the tags does not rely on special devices – the tags can be easily authenticated by human breath.

The technology’s attractive visual appearance makes it suitable for integration onto high fashion clothing and accessories; the technology also lends itself to combination with existing, market-dominating anti-counterfeit measures such as RFID tags, near field communication (NFC) and quick-read 2d barcode tags. In addition, due to the surface properties of the produced material, the technology can be used to make anti-biofouling coatings for medical devices, as well as for the production of self-cleaning surfaces.

Applications

- Anti-counterfeit measures: tags, labels, brand designs and logos
- Self-cleaning coatings for electronics
- Anti-biofouling coatings for medical devices
Advantages

- Does not rely on forensic analysis or use of specialized devices for authentication, but rather on human breath.
- Can be easily embedded into clothes and accessories due to its attractive iridescent appearance
- Technology could be combined with existing track & trace technologies for multi-level security devices

Inventors

Nicholas Kotov