

Executive Summary
Method and Apparatus for Testing Authenticity of Flat Objects

Innovation

The invention is a method and apparatus for determination of authenticity of flat objects using synchronous fluorescence spectroscopy (SFS). Flat objects include currency bills, checks, formal documents, IDs, badges, and fabrics like those in brand apparel. SFS is a method of optical analysis which uses a form of electromagnetic radiation (light). First, a flat object of questioned authenticity (Q) is placed on a support, and its fluorescent security feature or a small area of the object itself is visually identified under illumination with “primary visualization” light, like a UV lamp. Next, the selected area of an object is illuminated by the beam of light at continuously varied excitation wavelength, while the intensity of fluorescence from an object is simultaneously recorded at another emission wavelength. During the scan, the numeric difference between the wavelengths of emission and excitation is held constant, and the spectrum SFS(Q) of object Q obtained. The same procedure is conducted with a known authentic (A) object, resulting in SFS(A). Lastly, a comparison of spectra SFS(Q) and SFS(A), and/or the wavelengths of maximum emission of objects Q and A is conducted by the software. If the values are found to be the same, the Q object is concluded to be authentic.

Market Need

United States banknotes and currency are the most counterfeited in the world due to their distinction as a “hard currency” that is accepted around the world. As a result, there is major interest in new technologies to combat and stay ahead of counterfeiters. In fact, the global Counterfeit Money Detection market size alone is projected to reach \$3.404 billion by 2027, from \$2.327 billion in 2020, at a growth rate of 5.5% during 2021-2027.

Intellectual Property

U.S. Patent No. 10,950,079 was granted in March 2021.

Stage of Development

The authentication process has been demonstrated for banknotes, and the research team is seeking to validate its methodology to other flat objects.

Technology Transfer Opportunity

Although the innovation has a primary application in authenticating banknotes, which would interest banks, multinational companies, non-governmental organizations, and even governments, licensees might be interested in applying this technology to knockoff retail items such as sneakers and high-end purses and apparel.

Key Investigators

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Field(s) of Use

- Security
- Chemistry
- Spectrometry
- Forensics

Key Words

- Detection
- Counterfeit
- Flat
- Fluorescence

Advantages

- Applicable to a wide array of flat objects
- Ability to trace and source the chemicals for forensic analysis

Status

[Patent issued March 2021](#)

Links

[Inventor Bio](#)

Reference Number:

056/2019

Tech Transfer Contact

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