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Research area: Product aims

Paper, paperboard and board // Packaging papers and paperboard

Key words:

Paper structure, spectroscopy, C-14 dating, paper, paperboard

TITLE:**New analytical methods for detecting forgeries using the age determination of paper****Background/Problem area**

In many cases, paper can have considerable value and be the subject of forgery and counterfeiting. Printed or written paper, e.g. bank notes, identity cards, documents and wills can cause immense moral and financial damage if forged or counterfeited. The art market is currently complaining about an enormous rise in the number of forgeries which in some cases have been circulated by organised criminal groups, probably due to the desire to safely invest money in valuable paintings and drawings. Both businesses and consumers alike are worried about the large number of forged brand-name products (especially medication) as a result of pirate copies. At the moment, there is heightened activity with a view to protecting consumers from such forgeries.

At the moment, proof of the existence of certain substances or paper structures that were not yet the standard in papermaking at the disputed time can reveal forgeries. If there is no proof of such substances or structures, then it is impossible to restrict the period of time in question. The results of age determination have been unsatisfactory in most of the objects examined during the last few years and thus were of no help in the detection of forgeries and counterfeits.

Objectives/Research results

The objective of this project is to develop a comprehensive method for determining the age of paper in order to detect forgeries and counterfeits. Besides the age determination of historical documents and works of art, the forgeries and counterfeits of current paper productions are to be identified by a fast comparison of structures.

The project objective is to be achieved by the following subgoals:

- To develop mobile image acquisition for the rapid on-site analysis of a suspected forgery or counterfeit
- To develop a method of determining the age of paper using a spectroscopic procedure
- To develop a method for determining the C-14 age of paper measured by AMS (accelerator mass spectrometry) at the actual time the paper was being manufactured.

These methods will give the user the possibility of modular use as a function of the question to be answered (age dating of unknown samples, double-checking dated paper or the fast identification of forgeries and counterfeits).

A collection of approx. 200 different papers of varying composition and age were organised and catalogued in a database to provide a systematic approach. Initial work relating to mobile image acquisition is being evaluated at the moment. Special aspects of the equipment used in standard forensic laboratories have also been taken into consideration. Studies on the inclusion of individual NIR and IR spectra have not yet been concluded.

Application/Economic benefits

The new complex method is intended to be used in the investigatory work at the state criminal police (LKA) in art offences, examining the authenticity of paper documents, providing support for the 15th amendment to the German Law Governing Drugs with reference to the important point of drug safety, and to guarantee sales markets for paper mills by uncovering forgeries and counterfeits.

A number of small and medium-sized companies work in the new Bundesländer in the sectors of papermaking, printing and in the pharmaceutical sector. The results of this project are intended to contribute to strengthening or expanding their market shares.

Period of time: 01.01.2012 – 31.12.2013

Remarks

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