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(54) **MULTI-LEVEL DETECTION AND DETERRENCE OF COUNTERFEITING OF DOCUMENTS WITH REDUCED FALSE DETECTION**

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(57) **ABSTRACT**

Detection and deterrence of counterfeiting permits one to make legitimate color copies without introducing visual artifacts or experiencing substantial processing delays. We enable an efficient counterfeit deterrence by the use of an hierarchic detection scheme, in which the majority of documents are classified as free of suspicion using a simple algorithm that imposes a negligible computational burden. The remainder of documents, which are labeled as suspicious, receive analysis by one or more potentially complex detection algorithms. If the suspicious document is identified as being a secure document, this will lead to printing with selectively deteriorated service or complete denial of service. For one embodiment, the scheme uses a color look-up table (LUT) to detect a characteristic color (or colors) of frequently counterfeited documents and alters the characteristic color in the copies if a more accurate second test verifies that printing of a counterfeit is being attempted. A conventional test for counterfeit documents can be used as a second (or higher) level test. A particularly effective second level detector characterizes a suspicious pattern by the size of the suspected area, and the frequency of the transition between the foreground and background colors.

20 Claims, 7 Drawing Sheets