

Title (en)

A SECURITY SHEET OR DOCUMENT HAVING ONE OR MORE ENHANCED WATERMARKS

Title (de)

SICHERHEITSBLATT ODER -DOKUMENT MIT EINEM ODER MEHREREN VERBESSERTEN WASSERZEICHEN

Title (fr)

FEUILLE OU DOCUMENT DE SÉCURITÉ AYANT UN OU PLUSIEURS FILIGRANES AMÉLIORÉS

Publication

**EP 4163888 B1 20240703 (EN)**

Application

**EP 22210172 A 20141202**

Priority

- US 201361911141 P 20131203
- US 201361911885 P 20131204
- US 201361911831 P 20131204
- US 201461924000 P 20140106
- EP 19219466 A 20141202
- EP 18154768 A 20141202
- EP 14821361 A 20141202
- US 2014068205 W 20141202

Abstract (en)

[origin: WO2015084872A2] The invention generally relates to a security sheet or document having one or more enhanced watermarks. In one exemplary embodiment, the inventive security sheet or document is a single-ply paper that is made up of a paper layer including one or more watermarks, and a micro-optic security device {e.g., a patch or thread} that at least partially covers an upper or face portion of the watermark(s). The overlying patch or thread increases the durability of the watermark(s), thereby allowing for the watermark(s) as well as reduced fiber density areas therein to be made larger, and further allowing for the reduced fiber density areas to be made thinner. In a preferred embodiment, the micro-optic security device projects one or more synthetic images that coordinate or link in with the watermark design(s). In a more preferred embodiment, the micro-optic security device offers a machine detectable/readable feature in the form of enhanced IR- brightness, especially when measured in transmission. As will be readily appreciated, the inventive security sheet or document offers greatly improved counterfeit-resistance.

IPC 8 full level

**G07D 7/00** (2016.01); **B42D 25/29** (2014.01); **B42D 25/324** (2014.01); **B42D 25/333** (2014.01); **B42D 25/351** (2014.01); **B42D 25/355** (2014.01); **B42D 25/36** (2014.01); **B42D 25/369** (2014.01); **B42D 25/373** (2014.01); **B42D 25/378** (2014.01); **B42D 25/382** (2014.01); **B42D 25/387** (2014.01)

CPC (source: CN EP KR RU)

**B42D 25/324** (2014.10 - CN EP KR); **B42D 25/333** (2014.10 - CN EP KR); **B42D 25/351** (2014.10 - CN EP KR); **B42D 25/355** (2014.10 - CN EP KR); **B42D 25/36** (2014.10 - CN EP); **B42D 25/369** (2014.10 - CN EP KR); **B42D 25/373** (2014.10 - CN EP KR); **B42D 25/378** (2013.01 - CN EP); **B42D 25/382** (2013.01 - CN EP KR); **B42D 25/387** (2014.10 - CN EP KR); **G07D 7/00** (2013.01 - RU)

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)

**WO 2015084872 A2 20150611**; **WO 2015084872 A3 20150813**; AU 2014360693 A1 20160616; AU 2014360693 B2 20190704; BR 112016012684 A2 20170808; BR 112016012684 B1 20220111; CA 2932257 A1 20150611; CN 106163822 A 20161123; CN 106163822 B 20180508; EP 3078005 A2 20161012; EP 3078005 B1 20180207; EP 3333812 A1 20180613; EP 3333812 B1 20200219; EP 3690829 A1 20200805; EP 3690829 B1 20221130; EP 4163888 A1 20230412; EP 4163888 B1 20240703; ES 2664785 T3 20180423; ES 2779923 T3 20200820; ES 2938837 T3 20230417; JP 2016540335 A 20161222; JP 6534679 B2 20190626; KR 102336078 B1 20211208; KR 20160098293 A 20160818; MX 2016007197 A 20161028; MX 358966 B 20180911; PL 3333812 T3 20200713; PL 3690829 T3 20230411; RU 2680329 C1 20190219; RU 2680329 C9 20190404

DOCDB simple family (application)

**US 2014068205 W 20141202**; AU 2014360693 A 20141202; BR 112016012684 A 20141202; CA 2932257 A 20141202; CN 201480074261 A 20141202; EP 14821361 A 20141202; EP 18154768 A 20141202; EP 19219466 A 20141202; EP 22210172 A 20141202; ES 14821361 T 20141202; ES 18154768 T 20141202; ES 19219466 T 20141202; JP 2016557524 A 20141202; KR 20167017511 A 20141202; MX 2016007197 A 20141202; PL 18154768 T 20141202; PL 19219466 T 20141202; RU 2016125988 A 20141202