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PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC,
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Declarations under Rule 4.17:

- as to the identity of the inventor (Rule 4.17(i))
- as to the applicant's entitlement to claim the priority of the
earlier application (Rule 4.17(iii))

[Continued on next page]

(54) Title: EMBEDDED MULTI-COLOR IMAGE MARK FOR AUTHENTICATING PAPER

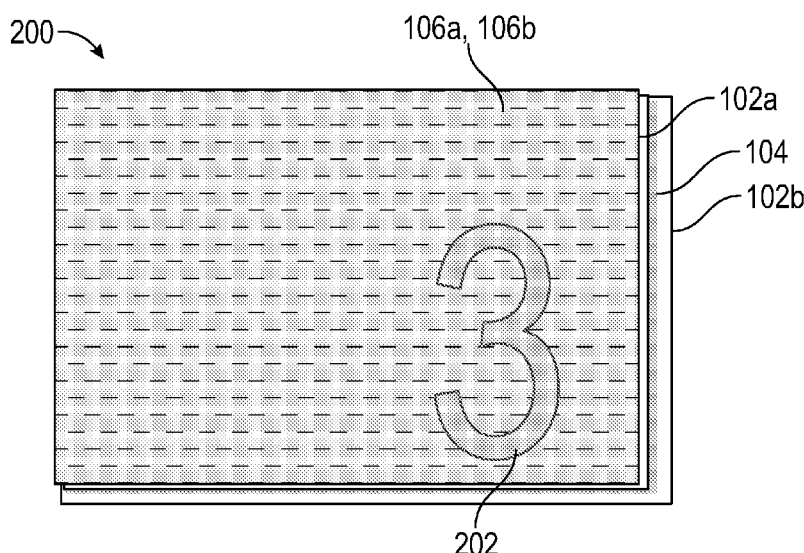


FIG. 1B

(57) Abstract: Exemplary embodiments of the present disclosure are directed towards an embedded multi-color image mark paper for authenticating paper. The embedded multi-color image mark paper includes two or more layers with multicolor and a unicolor image marks embedded between the two layers of the paper; and the paper further comprising a multi-color invisible ultra-violet (UV) security fibers, whereby a polyester material positioned between the two or more layers of the paper configured to furnish water resistant for preventing the paper from fragmentation and a paper included in one or more layers treated to make it fungus resistant.

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EMBEDDED MULTI-COLOR IMAGE MARK FOR AUTHENTICATING PAPER**TECHNICAL FIELD**

[001] The present disclosure relates to the field of authenticating paper. More particularly, the present disclosure relates to an embedded multi-color image mark for authenticating paper.

BACKGROUND

[002] Paper refers to wide variety of cellulose based sheet materials used for writing, printing and packaging. Paper may be used as catalogues certificates, checks, in books and the like without limiting the scope of the applications. Generally security papers have been included in fibrous materials in various shapes, color particles, silk threads, particles containing certain inorganic substances, fluorescent fibers, metalized fibers, metal wires, various non-fibrous thermoplastic materials and the like. The synthetic fibers have not found in security papers because of specific requirements of security papers.

[003] Generally, a great number of printed documents require highly reliable means of ensuring their authenticity due to some intrinsic value associated with them. Those printed documents range from banknotes to property titles and include things such as negotiable instruments, stock certificates, checks and passports. Moreover, to serve the more general purpose of allowing the public at large to rely on the authenticity of the images, that means should be permanent, durable and difficult to replicate. Hence an image authenticating mark cannot be used.

[004] In the light of aforementioned discussion there exists a need for an embedded multi-color image mark paper that would ameliorate or overcome the above mentioned disadvantage.

BRIEF SUMMARY

[005] The following presents a simplified summary of the disclosure in order to provide a basic understanding to the reader. This summary is not an extensive overview of the disclosure and it does not identify key/critical elements of the disclosure or delineate the scope of the disclosure. Its sole purpose is to present some concepts disclosed herein in a simplified form as a prelude to the more detailed description that is presented later.

[006] A more complete appreciation of the present disclosure and the scope thereof can be obtained from the accompanying drawings which are briefly summarized below and the following detailed description of the presently preferred embodiments.

[007] Exemplary embodiments of the present disclosure are directed towards embedded multi-color image mark paper.

[008] According to an exemplary embodiments of the present disclosure the embedded multi-color image mark paper includes two or more layers and the multicolor and unicolor image marks embedded between the two layers of the paper and the paper further comprising a multi-color invisible ultra-violet (UV) security fibers.

[009] According to an exemplary embodiments of the present disclosure the embedded multi-color image mark paper includes a polyester material positioned between the two or more layers of the paper configured to furnish water resistance for preventing the paper from fragmentation.

[0010] According to an exemplary embodiments of the present disclosure the embedded multi-color image mark paper includes a paper included in one or more layers treated to make it fungus resistant.

[0011] According to an exemplary embodiments of the present disclosure the embedded multi-color image mark paper includes two or more layers of the high tear resistant paper containing multi-color invisible ultra violet fibers and chemical sensitized paper providing a secure printing of the data.

[0012] According to an exemplary embodiments of the present disclosure the embedded multi-color image mark paper includes the polyester material positioned between the two or more layers forms the embedded image mark paper that is compatible to all kind of writing & printing processes.

[0013] According to an exemplary embodiments of the present disclosure the embedded multi-color image mark paper includes the multi-color embedded mark image visible 100% against the light source as otherwise only 30% and the embedded mark image cannot be scanned or reproduced. the embedded mark image visibility may be further reduced when any content that is printed on the paper

BRIEF DESCRIPTION OF DRAWINGS

[0014] Other objects and advantages of the present invention will become apparent to those skilled in the art upon reading the following detailed description of the preferred embodiments, in conjunction with the accompanying drawings, wherein like reference numerals have been used to designate like elements, and wherein:

[0015] FIG. 1A illustrates a layers of embedded multi-color image mark paper containing a polyester material between the layers, in accordance with an exemplary embodiment of the present disclosure.

[0016] FIG. 1B illustrates multicolor image mark embedded between two layers of the paper, in accordance with an exemplary embodiment of the present disclosure.

DETAILED DESCRIPTION

[0017] It is to be understood that the present disclosure is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the drawings. The present disclosure is capable of other embodiments and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting.

[0018] The use of “including”, “comprising” or “having” and variations thereof herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items. The terms “a” and “an” herein do not denote a limitation of quantity, but rather denote the presence of at least one of the referenced item. Further, the use of terms “first”, “second”,

and “third”, and the like, herein do not denote any order, quantity, or importance, but rather are used to distinguish one element from another.

[0019] Referring to FIG. 1A is a diagram 100 depicting layers of embedded multi-color image mark paper containing a polyester material between the layers, in accordance with an exemplary embodiment of the present disclosure. The embedded multi-color image mark paper for example may include two layers 102a, 102b, a polyester material 104 and multi-color invisible ultra violet fibers 106a and 106b.

[0020] The two layers of the embedded multi-color image mark paper may be referred as top layer 102a and the bottom layer 102b. The polyester material 104 is placed between the top layer 102a and the bottom layer 102b to provide water resistance in order to prevent the paper from fragmentation.

[0021] According to a non-limiting exemplary embodiment of the present disclosure, the embedded multi-color image mark paper contains the paper with invisible ultra violet fibers included in the bottom layer 102b and cotton content may be 25 percent rag content for secure printing of data and drying the printed ink quickly with chemical sensitization. The dimensions of security fibers length may be 3mm to 5mm and width may be 5 to 11 dtex, wherein the density of security fibers may be 15 to 20 fibers per 50mm to 50mm square surface of the paper. The embedded multi-color image mark paper 100 comprising the two layers 102a and 102b made of soft wood and hard wood and the paper weight ranges between 45 to 160 grams for square meter.

[0022] According to a non-limiting exemplary embodiment of the present disclosure, the embedded multi-color image mark paper 100 is compatible to all kind of writing and printing processes is provided to be fungal resistant. The embedded multi-color image mark papers 100 are also suitable for digital copiers, laser printers, offset and plan printing with fade and scuff resistant.

[0023] Referring to FIG. 1B is a diagram 200 depicting multicolor image mark embedded between two layers of the paper, in accordance with an exemplary embodiment of the present disclosure. The two layers of the embedded image mark paper 102a and 102b contain multicolor invisible ultra violet fibers 106a and 106b and chemical sensitized paper providing a secure printing of the data. The polyester material 104 positioned between the two layers 102a and 102b forms the embedded image authenticating mark 202 which is the numerical number “3” compatible to all kind of writing & printing processes. The embedded mark image 202 visibility is further reduced by any content printed on the paper.

[0024] As further shown in FIG. 1A and FIG. 1B the embedded image mark paper weight ranging between 125 to 360 grams for square meter. This embedded image mark paper 100 is useful for maps, property registration documents, maintenance sheets or books, instruction manuals, plans and technical drawings, menus, tags and any application where there is need for long-lasting performance. The embedded image mark paper is suitable for use in extreme weather conditions, as well as is water proof.

[0025] Although the present disclosure has been described in terms of certain preferred embodiments and illustrations thereof, other embodiments and modifications to preferred embodiments may be possible that are within the principles and spirit of the invention. The above descriptions and figures are therefore to be regarded as illustrative and not restrictive.

[0026] Thus the scope of the present disclosure is defined by the appended claims and includes both combinations and sub combinations of the various features described herein above as well as variations and modifications thereof, which would occur to persons skilled in the art upon reading the foregoing description.

CLAIMSWhat is claimed is:

1. An embedded multi-color image mark paper, comprising:

two or more layers with multicolor and a unicolor image marks embedded between the two layers of the paper; and the paper further comprising a multi-color invisible ultra-violet (UV) security fibers, whereby a polyester material positioned between the two or more layers of the paper configured to furnish water resistant for preventing the paper from fragmentation; and

a paper included in one or more layers treated to make it fungus resistant, whereby the embedded image market used to determine the authenticity of paper. .
2. The embedded multi-color image mark paper of claim 1, wherein the polyester material positioned between the two or more layers forms the embedded image mark paper is compatible to all kind of writing & printing processes.
3. The embedded multi-color image mark paper of claim 1, further comprising a water proof material on the paper due to this paper with printed data can contact with water for maximum time then the data printed over the paper is not affected.
4. The embedded multi-color image mark paper of claim 1, wherein the base paper treated to make it fungus resistant.
5. The embedded multi-color image mark paper of claim 1, wherein the two or more layers of the high tear resistant paper contains multi-color invisible ultra violet fibers and chemical sensitized paper providing a secure printing of the data.
6. The embedded multi-color image mark paper of claim 1 further comprising invisible ultra

violet fibers and cotton content, whereby the dimensions of security fibers length at least 3mm to 5mm and width at least 5 to 11 dtex; wherein the density of security fibers comprises 15 to 20 fibers per 50mm to 50mm squire surface of the paper.

7. The embedded multi-color image mark paper of claim 1, wherein the paper weight ranging between 125 to 360 grams for square meter.
8. The embedded multi-color image mark paper of claim 1, wherein the embedded mark image visibility further reduces any content printed on the paper.

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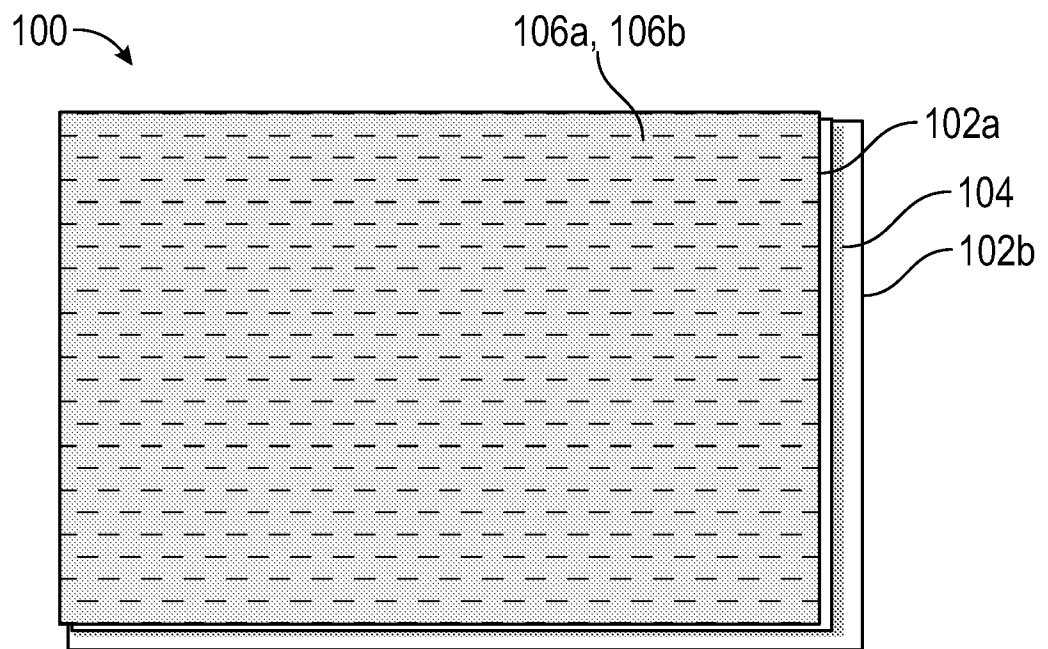


FIG. 1A

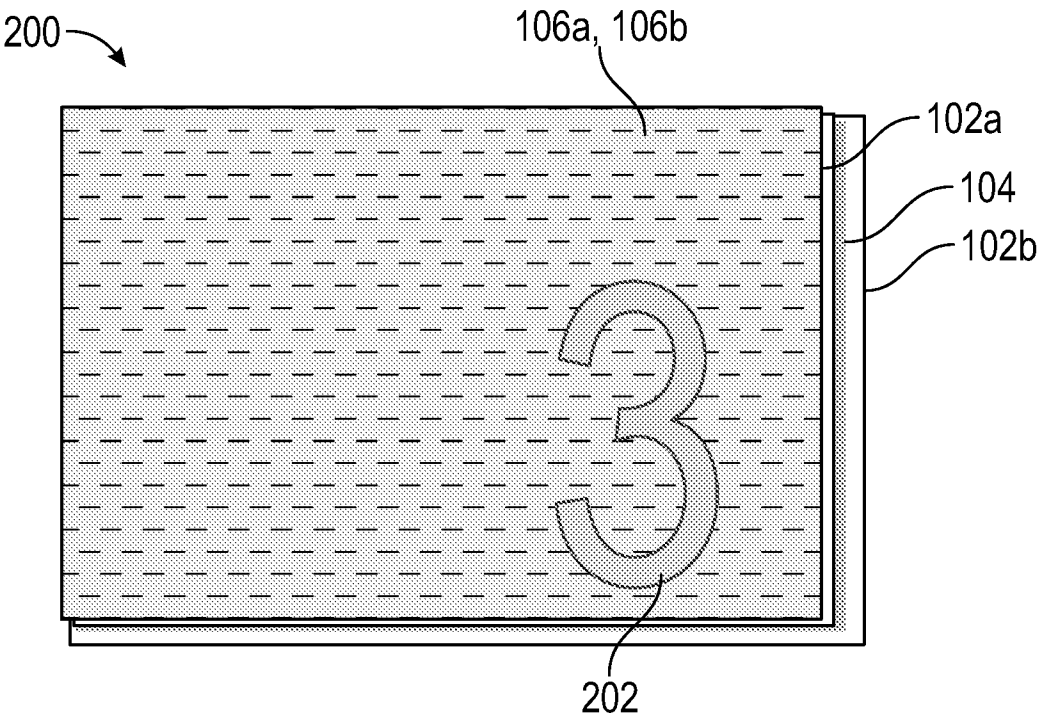


FIG. 1B

INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER
D21H21/00, D21H27/38, G07D7/12, B42D25/30, B42D25/387, B32B27/10
Version=2016.01
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

D21H, G07D, B42D, B32B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Patseer, IPO Internal Database

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0628408 A1 (ANDRIC D et al.) 14 December 1994; Abstract, page 5, line 26 - page 6, line 27; page 6, line 45 - line 55; page 7, line 7 - line 21, figure 1	1-8
Y	US 4921280 A (JALON M) 01 May 1990; col 1, line 12 - line 63; claims	1-8
Y	WO 2012049514 A2 (D.W. SPINKS (EMBOSSING) LIMITED) 19 April 2012; page 1, line 25 - page 2, line 11, page 3, line 13 - line 28	1-8
Y	GB 2241966 A (FABRICA NACIONAL DE MONEDA Y TIMBRE) 18 September 1991; page 4, line 5 - line 14; page 6, line 1-5	1

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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INTERNATIONAL SEARCH REPORT
Information on patent family members

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Citation	Pub.Date	Family	Pub.Date
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