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(54) **DATA CARRIER WITH TACTILE PRINTED AREA FOR INK WRITING DATA**

(57) The present invention relates generally to a data carrier comprising a data sheet. Said data sheet comprises a substrate material wherein at least one printed area is printed. Said printed area is configured for ink written signature. Said printed area is produced by imprinting via intaglio printing and comprises tactile perceptibility structured embossed pattern produced by the imprinting. Said tactile structured embossed pattern is configured to hold the ink of the ink written. The present invention prevents unwanted smudging or spreading when writing on the printed area. Moreover, the present invention addresses also the forgery and manipulation drawbacks on ink written data on data carrier.

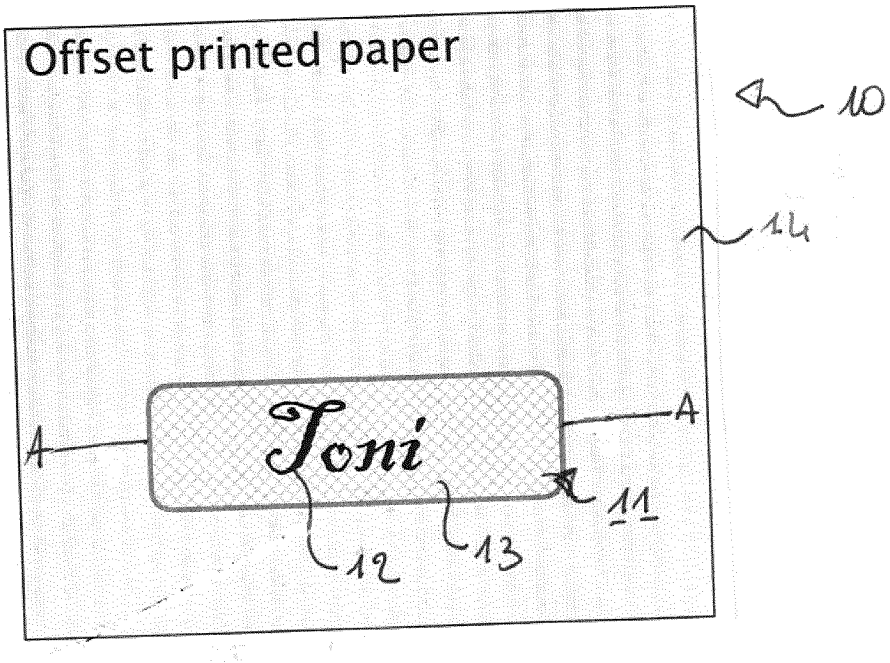

Fig 1

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Description

TECHNICAL FIELD

[0001] The present invention relates generally to a data carrier comprising a printed area with embossing surface structure configured for preventing ink writing from smudging, spreading and manipulation.

EMBOSSED ART

[0002] Historically, handwritten signatures have been used to identify a particular person and to bind that person to a particular document. A person's signature on a particular document supported the assertion that the person read and/ agreed to the document's content.

[0003] Many documents (eg administrative or official) include handwritten signature that is desirable to protect against forgery. For example, an identity card, passport, driving license, gray card, a check, pay slip, bank statement, a diploma, a birth, a deed or document medical (such as a medical prescription or a certificate), an electricity receipt, include handwritten signature which may be more or less easily falsified by a malicious person.

[0004] The means used by counterfeiters are numerous and include chemical solvent-type, means scraping and peeling, which aim to remove or delete the signature.

[0005] It is therefore desirable to produce data carrier with elevated protection against forgery and manipulation of handwritten signature using a method that is simple and cost effective.

[0006] Moreover another issue encountered when writing on paper of the document (eg administrative or official) is that the ink from the pen may not stick and dry easily and can cause unwanted smudging or spreading.

SUMMARY OF THE INVENTION

[0007] The following summary of the invention is provided in order to provide a basic understanding of some aspects and features of the invention. This summary is not an extensive overview of the invention and as such it is not intended to particularly identify key or critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some concepts of the invention in a simplified form as a prelude to the more detailed description that is presented below.

[0008] In view of the shortcomings of the prior art, it is an object of the present invention to increase the security and anti-counterfeiting capabilities of a written signature on a variety of data carrier, such as passports, licenses, identification card, official or administrative documents...

[0009] A printed area is provided in the data carrier for the written signature. The printed area comprises embossed lines extended at different angles to each other defining different shapes that are visible to a greater or lesser as the data carrier is tilted, rotated or viewed from different angles relative to the light source. The embossed lines in some of the regions are finer than coarser and deeper and more widely spaced lines in the other regions. The coarser, deeper lines are of such a thickness and width as to be detectable by touch in addition to being visible by the naked eye.

[0010] These embossed lines allows to ease the smudging problem and address also the aforementioned forgery and manipulation drawbacks on ink written data on the printed area of the data carrier.

[0011] The embossing can comprise a regular matrix of embossed lines or dots or the like which together define a predefined pattern. The embossed pattern may include one or more embossing deeper than other embossing and/or it may include embossed lines or series of dots extending at different angles to each other.

[0012] In an embodiment, the embossed pattern includes a first set of substantially parallel lines and a second set of substantially parallel lines extending at an angle with respect to the first set of parallel lines so that as the ink of the written is stuck into the trough of the embossed pattern. This embossed pattern helps writing on it as the surface is rough and ink is kept hold on the trough without smudging.

[0013] In an embodiment, the embossed pattern may include embossed lines or dots of different depth, width or size so as to introduce different shapes into the pattern so as the written ink is hold durably into the trough. Preferably, at least some of the lines, dots or other embossing are of a sufficient depth and/or width to be capable of detection by the naked eye and by touch.

[0014] The embossed pattern, detectable with the sense of touch, forms a tactile security feature. Indeed, the embossed pattern creates visually easily detectable effect that increases the security significantly against missuses. This embossed pattern is a security feature that can be identified and recognized as authentic by the viewer without aids. Said embossed area is distinguishable from imitations and forgeries. These are e.g. tactile motifs of the embossed area are characterized by their typical tactility easily recognizable and cannot be imitated with without special equipment's and skills.

[0015] The embossing are preferably formed by applying an embossing plate to the portion of the substrate material corresponding to the written area under heat and pressure. A convenient embossing temperature may fall substantially within the range from 70 to 85° C., preferably about 80° C., and a convenient embossing pressure may fall substantially within the range 30 to 40 MPa.

[0016] The configuration of this printed area has increased falsification security since they are not reproducible with common printing processes due to the characteristic of the embossed pattern tactically recognizable.

[0017] According to an embodiment of the present invention, the embossed area is produced with an Intaglio printing (Engraved Copperplate printing) process. This printing process is characterized by engraving or etching depressions into a printing plates to produce a printed image onto the embossed area.

[0018] According to an embodiment of the present invention, the embossed pattern is printed with any motif desired. It is particularly preferred to use motifs that are elaborated to print, in particular structured printed images, such as guilloches, alphanumeric characters, etc.

[0019] To achieve those and other advantages, and in accordance with the purpose of the invention as embodied and broadly described, the invention proposes a data carrier comprising a data sheet, said data sheet comprising a substrate material having a part bearing at least one printed area, said printed area being configured for ink written data, wherein said printed area comprises raised areas and depressed areas forming an embossed pattern, the depths, widths and/or design of the raised areas and depressed areas are configured to keep the ink of the ink written filled into the depressed area so that to prevent smudging, spreading and manipulation.

[0020] In an embodiment, the ink written data is made with a handwritten or a machine written.

[0021] In an embodiment, the embossed pattern comprises a matrix of lines, dots or other embossing.

[0022] In an embodiment, the embossed pattern comprises embossed lines or series of dots extending at different angles to each other.

[0023] In an embodiment, the embossed pattern comprises at least one raised area that is deeper or wider than other raised area.

[0024] In an embodiment, the embossed pattern is formed by blind-embossed pattern.

[0025] In an embodiment, the embossed pattern comprises alphanumeric characters, serial numbers, codes, symbols, images or geometric patterns.

[0026] In an embodiment, the substrate material of the printed area is paper, plastic, plastic foil laminated or coated paper, or multilayer composite materials.

[0027] In an embodiment, the substrate is printed with parallel lines or shapes so that the structured embossed pattern provide an optical Moire effect.

[0028] The present invention is also related to a data carrier comprising a printed area configured for ink written, said printed area being produced by imprinting via pressing, stamping, intaglio printing or with similar physical force, and having a tactile perceptibility structured embossed pattern produced by the imprinting configured to hold the ink of the ink written.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] The following detailed description will be better understood with the drawings, in which:

FIG. 1 schematically illustrates a plan view of a tactile printed area for ink written into a data carrier substrate, according to the invention.

FIG. 2 schematically illustrates a cross section through the printed area, according to the invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS OF THE INVENTION

[0030] As shown in the drawings for purposes of illustration, the invention is embodied in a data carrier comprising a secure ink writing area.

[0031] It is to be understood that various other embodiments and variations of the invention may be produced without departing from the spirit or scope of the invention. The following is provided to assist in understanding the practical implementation of particular embodiments of the invention.

[0032] The same elements have been designated with the same referenced numerals in the different drawings. For clarity, only those elements which are useful to the understanding of the present invention have been shown in the drawings and will be described.

[0033] Reference throughout the specification to "an embodiment" or "another embodiment" means that a particular feature, structure, or characteristic described in connection with an embodiment is included in at least one embodiment of the subject matter disclosed. Thus, the appearance of the phrases "in an embodiment" or "in another embodiment" in various places throughout the specification is not necessarily referring to the same embodiment. Further, the particular features, structures or characteristics may be combined in any suitable manner in one or more embodiments.

[0034] Hereafter, an embodiment of the present invention will be described in the context of data carrier comprising a tactile ink written printed area. Such a data carrier includes, but is not limited to, a driving license, a badge or pass, a passport, a discount card, a membership card, a diploma, a banking card, a credit card, a money card, and other security documents and papers of value that are to be provided with ink written data in such a way that they cannot be easily imitated by common means and are also protected from attempted manipulation.

[0035] FIG. 1 illustrates a schematic view of a data sheet 10 of a data carrier (not shown). In the example herein described, the data carrier is a passport and the data sheet 10 is a page of the passport.

[0036] The data sheet 10 may bear a name, date of birth, place of birth of the data carrier holder. The data sheet 10 comprise a printed area 11 configured to receive an ink written 12. The printed area 11 is configured so that any ink written 12 into it is prevented from smudging or spreading and protected from forgery. The ink written 12 can be handwritten or made through a machine writer such as known ink-jet printer. The ink written 12 can be anything as such the data carrier holder signature, a personalized data of the data carrier holder such name, date of birthday....

[0037] FIG. 2 shows the printed area 11 depicted in FIG. 1, in cross section along the line A-A. The printed area 11 is printed onto a substrate 14 of the data sheet 10.

[0038] The substrate material 14 of the printed area

may be any substrate materials that can be used for ink written, such as paper, plastic, plastic foil laminated or coated paper, as well as multilayer composite materials. In a preferred embodiment, the substrate 14 is a paper, in particular based on cotton fibers.

[0039] The substrate material 14 of the printed area 11 can be the same or different of the substrate material of the data sheet 10 bearing said printed area.

[0040] The printed area 11 comprises raised areas15 and depressed areas 16 to provide an embossed pattern 13. The means for embossing the printed area substrate 14 preferably comprises at least one embossing plate which is applied to said printed area substrate 14 under heat and pressure to produce said embossed pattern. The embossing plate preferably includes a matrix of engraved lines, dots or other engraved formations which, when applied to said portion of the substrate 14, produces a corresponding matrix of embossed lines, dots or other formations forming the required pattern on the printed area 11.

[0041] Preferably, some of the lines, dots or engraved formations are deeper and/or wider than other lines, dots or engraved formations on the embossing plate, so as to produce embossed lines, dots or other formations of different depths and/or widths on said portion of the substrate. The lines, dots or other formations of different depths and/or widths may form different shapes within the embossed image.

[0042] In an embodiment, the embossed lines are between 5 to 100 wide and/or deep but not limited. During test, it is appeared that a height of the raise area 15 between 20 to 50 microns allows to hold the ink filled into the depressed area 16 in a way preventing from smudging, spreading and manipulation.

[0043] The strength of the security of the printed area 11 depends on the different depths and/or widths of the embossed pattern 13 and/or to the design of said embossed pattern.

[0044] In a preferred embodiment, the embossing plate includes engraved sets of lines extending at different angles and defining different shapes so that the embossed pattern 13 includes different shapes which become more or less apparent as the data sheet 10 is rotated or viewed from different angles.

[0045] In an embodiment, the embossing plates can form part of an intaglio printing press having printing means in the form of a printing plate cylinder and pressure-applying means in the form of an impression cylinder. The Intaglio printing is preferably done with Intaglio printing plates produced by engraving with a fast rotating, tapered graver, for example by a method described in WO 97/48555. The engraving technique of so-called "separating edges" according to WO 00/20216 and WO 00/20217 can be also used. The engravings can fundamentally also be produced by laser engraving or etching or any other suitable removal method.

[0046] In an embodiment, before the actual printing operation, ink of pasty consistency can be applied to the engraved printing plate representing the embossed patterns 13 and surplus printing ink is removed from the surface of the printing plate by means of a wiping blade or wiping cylinder, so that ink remains only in the depressions. Then the substrate 14 of the printing area 11, as a paper of the data sheet 10, is pressed against the printing plate and thus also into the ink-filled depressions of the printing plate, and removed again, whereby ink is drawn out of the depressions of the printing plate, sticks to the substrate 14 surface and forms the embossed pattern 13 of the printed area 11.

[0047] In an embodiment, transparent inks can be used wherein the thickness of inking determines the shade. A light shade is thus obtained when a white data carrier is printed with small ink layer thicknesses, and darker shades when it is printed with thick ink layers. The ink layer thickness is in turn dependent to some degree on the engraving depth.

[0048] In another embodiment, the structured embossed pattern 13 can be blind-embossed area. To produce said blind-embossed area, the engravings of the printing plate are not, or at least partly not, inked, i.e. not filled with printing ink, before the printing operation. The non-inked area of the printing plate acts only as an embossing plate with which the stated blind embossings can be produced on the substrate 14 during the intaglio printing operation. The embossed elements have similar proportions and tactile properties to the printed areas, with the exception of the visual impression produced by the printing ink. These blind embossings can also be perceived tactilely.

[0049] The embossing plates contain projecting portions and recesses or grooves forming an arrangement or matrix of engraved lines, dots or other engravings, preferably of different depths or sizes so that when the substrate passes through the nip between the plate cylinder and the impression cylinder, as known by the skilled person, the substrate 14 of the printed area 11 is embossed with the matrix of lines, dots or other engravings to form the raise area 15 and the depression area 16.

[0050] The embossed lines, dots or other engravings may be arranged to form a pattern of any desired shape which is visible for a naked eye and the direction, width and/or separation of the lines, the size of the dots or other engravings and the depth of the lines, dots or other engravings may vary at different locations of the engraving so as to produce different shapes within a pattern. This pattern produces with different shapes allows providing depressions area 16 with different depth and/or width able to stuck the ink of the inkwritten filled into the trough preventing by this way the smudging, spreading and manipulation of said written.

[0051] The partial deformation of the paper surface of the substrate 14 of the printed area 11 resulting from the paper being pressed into the engraving of the printing plate, is easily palpable manually and thus also readily recognizable as an authenticity feature by its tactility. The tactility cannot be imitated with a copy machine, so that

the printed area 11 offers protection against forgeries.

[0052] According to an embodiment of the present invention, the printed area 11 is at least large enough for the ink written 12 and to be easily visible and tactilely checkable. In an embodiment, the minimum area of such a printed area 13 can be about 1 to 5 cm^2.

[0053] The printed area 11 printed onto the substrate 14 comprises structured embossed pattern 13.

[0054] According to the embodiment illustrated at FIG. 2, in the aim to strengthen the security then the raise area 15 and the depression area 16 of the embossed pattern 13 is not equally pronounced over the total printed area 11. Particularly, the raise area 15 thus the surface relief can be greater at least in certain areas in the printed area 11. The tactility of the printed area 11 from the raise area 15 can be increased by more inking and stronger embossing. This is normally obtained by deeper engravings in the printing plate used.

[0055] The different raise area 15 of the embossed pattern 13 of the printed area 11 can optionally be visualized depending on the type of printing ink used. When transparent printing inks are used, the color effect is dependent on the printed ink layer thickness, i.e. the thicker the ink is printed, the darker the printed motifs appears, and vice versa. When opaque printing inks are used, the brightness impression is independent of ink layer thickness. With a skillful choice of printing inks and ink layer thicknesses the appearance of the printed motifs can make the tactility of the motif recognizable to the naked eye or not.

[0056] The structured embossed pattern 13 tactilely perceptible offers effective protection against imitation by color photocopying or scanning of the data carriers. Additionally the ink written data on the printed area 11 are reliably protected from attempts at tampering. The present invention therefore combines in a unique way the advantages of tactile embossed pattern for ink written into a data carrier.

[0057] The structured embossed pattern 13 can be alphanumeric characters, for example serial numbers of the data carrier 10 or any codes, such as for example one-dimensional or two-dimensional bar codes or blind codes, any symbols or images. Any alphanumeric characters, such as date, time, batch designation, or writings, are possible, too. Of course, any geometric patterns can also be produced, such as for example a knobbed structure. The structured embossed pattern 13 can be a guilloche pattern easily detectable tactilely.

[0058] Advantageously, the ink written data onto the printed area 11 is substantially protected against forgery, manipulation, and smudge wihile having an improved durability. The printed area 11 has an effective copy protection since distinctive visual impression of the structured embossed pattern 13 cannot be rendered by common forgery methods.

[0059] The structured embossed pattern 13, in addition to increased security of the ink written, can also provide optical effects, contributing to the overall security of the printed area 11. Indeed, structured embossed pattern 13 can provide the optical Moire effect, which cannot be copied on copying machines. The Moire effect will be visible on the substrate 14 printed with parallel lines or shapes as illustrated in FIG. 1.

[0060] Although the present invention is described as implemented in the above described embodiment, it is not to be construed to be limited as such. Other materials, for example, papers or plastic materials of different surface nature, such as photographic papers, passes, documents, value-bearing papers, checks, any support having wherein a secure ink written is needed can be used.

Claims

1. A data carrier comprising a data sheet, said data sheet comprising a substrate material having a part bearing at least one printed area, said printed area being configured for ink written data, wherein said printed area comprises raised areas and depressed areas forming an embossed pattern, the depths, widths and/or design of the raised areas and depressed areas are configured to keep the ink of the ink written filled into the depressed area so that to prevent smudging, spreading and manipulation.

2. Data carrier according to the previous claim, wherein the ink written data is made with a handwritten or a machine written.

3. Data carrier according to any previous claims, wherein the embossed pattern comprises a matrix of lines, dots or other embossing.

4. Data carrier according to any previous claims, wherein the embossed pattern comprises embossed lines or series of dots extending at different angles to each other.

5. Data carrier according to any previous claims, wherein the embossed pattern comprises at least one raised area that is deeper or wider than other raised area.

6. Data carrier according to any previous claims, wherein the embossed pattern is formed by blind-embossed pattern.

7. Method according to any previous claims, wherein the embossed pattern comprises alphanumeric characters, serial numbers, codes, symbols, images or geometric patterns.

8. Data carrier according to any previous claims, wherein the substrate material of the printed area is paper, plastic, plastic foil laminated or coated paper, or multilayer composite materials.

9. Method according to the previous claim, wherein the substrate is printed with parallel lines or shapes so that the structured embossed pattern provide an optical Moire effect.

10. Data carrier according to any previous claims, wherein the data sheet is an identity card, a page of a passport, a credit card or the like.

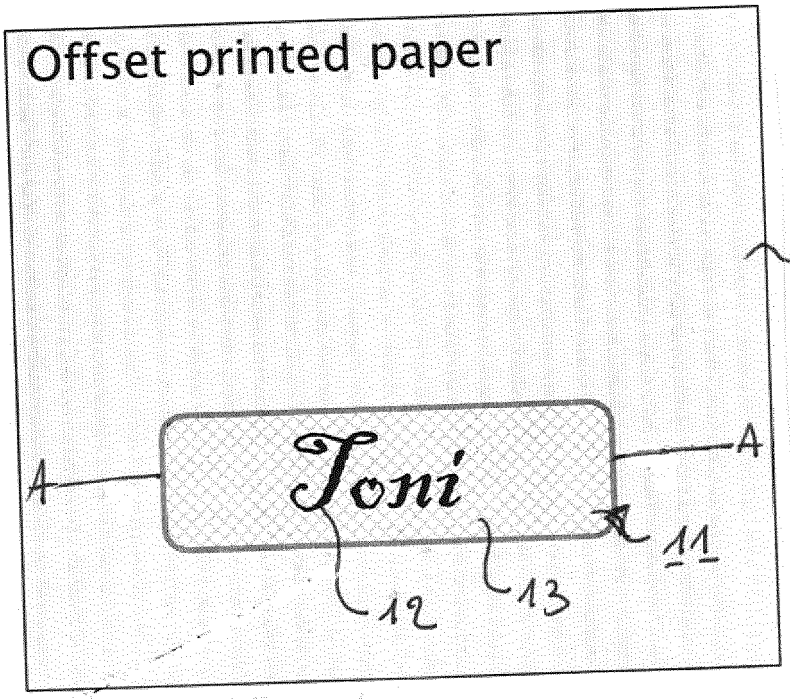

Fig 1

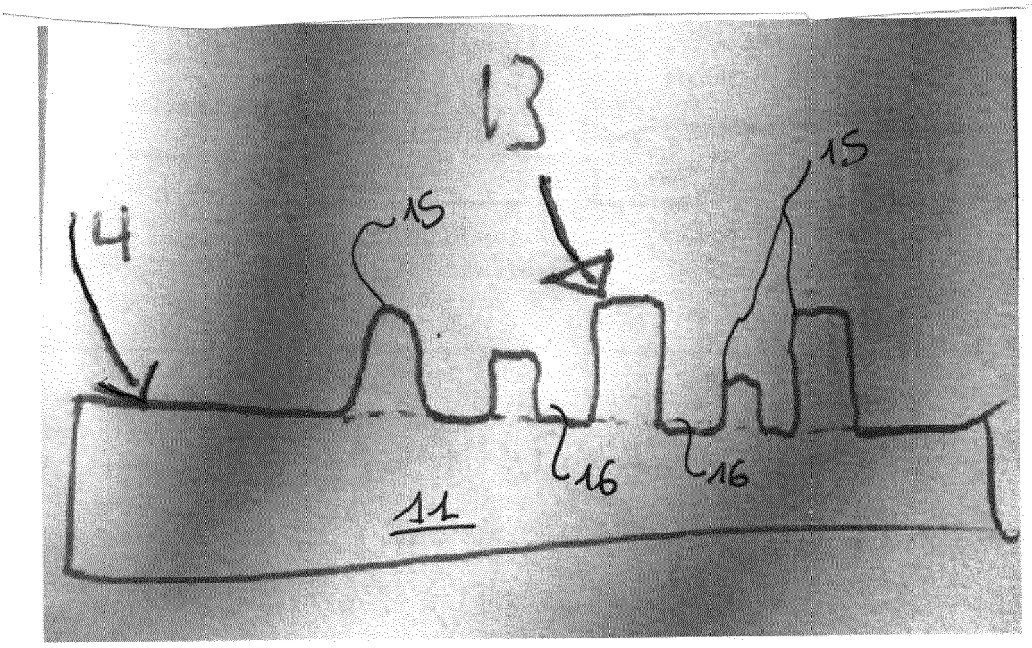

Fig 2.

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EUROPEAN SEARCH REPORT

Application Number
EP 17 30 5814

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 10 2007 052176 B3 (OVD KINEGRAM AG [CH]) 5 February 2009 (2009-02-05)	1-4,6-10	INV. B42D25/425
A	* paragraph [0039] *	5	
A	GB 2 531 582 A (DE LA RUE INT LTD [GB]) 27 April 2016 (2016-04-27) * figure 2 *	1	

TECHNICAL FIELDS SEARCHED (IPC)

B42D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 August 2017	Langbroek, Arjen

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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22-08-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102007052176 B3	05-02-2009	CA 2703616 A1	07-05-2009
		DE 102007052176 B3	05-02-2009
		EP 2209654 A2	28-07-2010
		ES 2490145 T3	03-09-2014
		US 2012031978 A1	09-02-2012
		WO 2009056228 A2	07-05-2009
GB 2531582 A	27-04-2016	CN 107000461 A	01-08-2017
		EP 3209502 A1	30-08-2017
		GB 2531582 A	27-04-2016
		US 2017225503 A1	10-08-2017
		WO 2016063052 A1	28-04-2016

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Patent documents cited in the description

- WO 9748555 A **[0045]**
- WO 0020216 A **[0045]**
- WO 0020217 A **[0045]**