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(11) **EP 1 149 709 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
31.10.2001 Bulletin 2001/44

(51) Int Cl.7: **B41M 7/00**, B41M 3/14,
G03G 8/00

(21) Application number: **01303870.8**

(22) Date of filing: **27.04.2001**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **27.04.2000 GB 0010146**

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(54) **Security coating process of documents**

(57) A method of making a secure printed document comprises printing a first coating onto to selected areas of a substrate, laser printing a toner image onto the coated areas, fusing the toner image, and printing a second

coating onto at least part of the toner image. The second coating is selected to allow the toner generated image to be scanned through the second coating using machine reading techniques.

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Description

[0001] This invention relates to improvements in toner bonding and security.

[0002] It has long been recognised that toner deposition systems have a number of weaknesses that make them unsuitable for use with data that is vulnerable to alteration.

[0003] Two of these weaknesses are related to the way the toner is bonded to the surface of the paper and both affect the security of the document. A third is associated with the material composition of toner.

[0004] The first is the effect that variations in paper surface have on the bond, it has been shown that indentations i.e. watermarks and normal variation to surface characteristics of the paper can reduce the strength of the bond between the toner and the surface. This can result in the toner breaking off during the life of the document or in the extreme cases not bonding at all. Documents with poor bonding or incomplete characters from this problem impact upon the detection of deliberate alterations, as the persons checking the document become use to seeing variations within the characters on genuine data and therefore becomes less able to determine what is altered.

[0005] The second problem is that, as the bond of the toner does not penetrate the surface of the paper it means that the bond can be broken by physical force alone and this may mean that the level of distribution to the surface of the substrate is low which means the detection by visual means is very difficult. The third problem is due to the material used to produce the toner. Toner was never intended for use as a security feature and therefore the majority of common toners do not contain materials that lend themselves to detection by machine-readable techniques.

[0006] With the increasing demand for higher speeds in personalisation of security documents, the use of toner deposition systems has increased and this process has been developed to tackle these three major problems. It is a process that will give increased security to toner produced data and will introduce a method by which the integrity of the coating can be verified by machine-readable techniques.

[0007] The object of this process is three-fold the first is to produce a surface that gives a stronger bond to toner than the surface of the paper. The second is to add a security coating to selected areas of the document, that will improve the security of the toner allowing the integrity of the data below to be validated by machine reading techniques. This process also allows the materials to be applied only where the toner-generated data may be applied, minimising the use of materials.

[0008] The invention provides a two-part security coating process, the first part being a coating that improves the bonding of hot melt toner this is applied to the substrate in selected areas, and the second part a coating applied to the fused toner in the areas of data

that are at high risk of alteration to be checked for integrity by machine reading techniques. This coating may contain materials that allow the integrity of the coating to be verified by machine-readable techniques.

[0009] The process is for coating a secure bond for toner deposition images and the application of a secure coating and may comprise a selective coating applied to selective areas of the fused toner.

[0010] The coating applied on to the fused toner may be machine readable by the use of transmission and reflectance of any or a combination of visible light, Ultra violet light and/or infra red light.

[0011] The material applied to the surface of the substrate may be cured by the use of one or more external energy sources comprising any of IR, UV radiation, Electron beam or any other suitable energy source.

[0012] The coating applied on top of the toner may be cured by the use of one or more external energy sources comprising any of IR, UV radiation, Electron beam or any other suitable energy source.

[0013] The coating to the substrate may be applied using a printing process i.e. a lithographic process, a flexographic and Gravure process or any or any other printing process.

[0014] The coating applied on top of the toner maybe applied using a printing process i.e. lithographic process, flexographic and Gravure process or any other printing process.

[0015] A separate coating may be applied to the substrate and a further coating then applied on top of the fused toner.

[0016] The first step in the process is preferably to print a coating onto the surface of the paper in at least the areas where the toner would be applied. This coating is preferably applied on the top of any other printed designs. The coating can be applied by a printing process such a lithographic, Gravure or flexographic or any other printing process. The documents may then be processed in toner deposition system and the toner is then fused as normal within the machine.

[0017] The fused images are than preferably coated with a material over all or some of the toner generated marking. The coating may be applied by the flexographic lithographic printing process or Gravure or any other printing process.

[0018] With the use of this process the toner bonding variations that occur naturally on the surface of the paper can be reduced thus increasing the bonding of the toner to the paper. The coating gives improved security against deliberate remove of toner by physical means and a method by which the area of toner generated data can be scanned using machine reading techniques.

[0019] A process according to the invention will now be explained by way of an example.

Example Laser Printing

[0020] In accordance with the invention, the first proc-

ess step is to print a coating on to the document to be laser (toner-deposition) printed in at least the areas where the toner is to be deposited on to the substrate. This is done using a printing process and the material is applied on top of any other printings on the document, in at least the areas onto which the toner is to be applied. The second process is to laserprint the variable details onto the document. The toner is then fused in the standard way.

[0021] The document with the fused toner is then coated with a second layer using a printing process; the coating is used to cover at least the most sensitive toner generated data. The document is then issued, once the document is used and returned for reconciliation it can be passed along a track with a reader that checks if the coating is till intact and therefore if the data safety has been compromised.

Claims

1. A document security coating process, **characterised by** applying a first coating to a substrate to cover selected areas of the substrate to improve the bonding of a hot melt toner to the substrate, and applying a second coating to said toner after fusing of the toner, in selected areas of the document.
2. A process according to claim 1 wherein said coating includes one or more materials which allow the integrity of the coating to be verified by machine-reading techniques.
3. A process according to claim 2 wherein said second coating may be machine readable by transmission and reflectance of any one or a combination of visible, ultra-violet or infrared light.
4. A process according to any proceeding claim wherein said first coating is cured by use of one or more external energy sources.
5. A process according to any proceeding claim wherein said second coating is cured by use of one or more external energy sources.
6. A process according to claim 4 or 5 where said respective one or more external energy sources comprise one or more of infrared, ultra violet or electron beam emitting devices.
7. A process according to any proceeding claim wherein said first coating is applied to the substrate using a printing process.
8. A process according to any preceding claim wherein said second coating is applied over the toner using a printing process.
9. A method of making a secure printed document comprising printing a first coating onto selected areas of substrate, laser printing a toner image onto said coated areas, fusing said toner image, and printing a second coating onto at least part of said toner image, and the second coating being of material to permit the toner generated image to be scanned using machine reading techniques through the second coating.