

We've Patented the Future of the Authenticity

Taras Rodtsevych, Founder and CEO and Bohdan Saliy, Co-Founder have been awarded a patent for a device and method for the marking and verification of the authenticity of origin of goods and protection against counterfeiting. This patent #114778 was awarded on July 25, 2017 in Ukraine.



Claims

1. A device for the marking and verification of the authenticity of origin of goods and protection against counterfeiting, comprising a product identifier with a unique pattern, an enclosure, and a unique code of the identifier which corresponds to an entry in an electronic database, which database contains an electronic reproduction of the unique pattern of the product identifier, wherein the product identifier is made of a plate of transparent or translucent brittle amorphous material, placed in the enclosure composed of a transparent material, in which the unique pattern is formed by cracks created by virtue of an impact or pressing of a solid body against the plate and which product identifier is designed in a way that enables visually to compare the unique crack pattern made in it with an electronic reproduction of the crack pattern of such product identifier, stored in the electronic database with the use of an electronic computing device connected to the Internet.
2. The device of claim 1, wherein the enclosure is composed of a film of transparent elastic material or is made in the form of a container made out of a solid transparent material.
3. The device of either of claims 1 or 2, characterized in that the unique code of the identifier is comprised of information in the form of text and/or, barcode and/or QR code and/or web address at which the electronic image of the product identifier can be found for the verification purposes.
4. A method for marking and verification of the authenticity of origin of goods and protection against counterfeiting, comprising the production of the product identifier with a unique pattern, assigning a unique code to the product identifier, entering into an electronic database of a record with information about the product identifier which record contains an electronic reproduction of the product identifier unique pattern, a unique code, and the information about the product to which the unique identifier is attached and the manufacturer of such a product, attaching of the product identifier to the product, verifying of the authenticity of origin of the product by comparing the unique pattern of the product identifier with a graphic representation of the unique pattern stored in the database with the use of an electronic computing device with a graphic screen and connected to the internet, wherein:
 - The product identifier is made of a plate of transparent or translucent brittle amorphous material, placed in the enclosure made of a transparent material whereafter the pattern of the product identifier is created by the cracks formed in the identifier plate as the result of an impact or pressing of a solid body against the plate;
 - Verification of the authenticity of origin of the product is performed by a visual comparison of the unique crack pattern of the product identifier itself with the electronic reproduction of the crack pattern obtained from the database by the unique code of such product identifier, namely by placing the product identifier side by side or against the electronic reproduction of the product identifier obtained on the screen of an electronic computing device.
5. The method of claim 4, wherein the unique code of the product identifier is applied to the product identifier or its case in the form of text, barcode, QR code, or a web address, at which the electronic image of the product identifier is located.
6. The method of either claims 4 or 5, wherein before the entry of a record with the information about a newly manufactured unique product identifier into the electronic database, the ability of the human eye to distinguish electronic image of unique crack pattern of such new product identifier from that of any product identifiers previously recorded in the database is established by comparing the electronic reproduction of the unique crack pattern of such new product identifier with the electronic images of unique crack patterns of the product identifiers which have been recorded in the database earlier, taking into account the resolution capabilities of the human eye; the information about the product identifiers, with respect to which it has been established that they are indistinguishable by the human eye from electronic reproductions of any of the product identifiers previously recorded in the database, is not entered into the database and such product identifiers are discarded.

Description

Area of the invention: the invention relates to methods for the identification of goods and protection of goods against counterfeiting by making unique identifier, attaching the same to the product and enabling further verification of the identifier.

The purpose of the invention is to develop a method of marking and verification of the authenticity of origin of goods that allows a potential consumer to verify the authenticity of origin of a product prior to purchasing it for an unlimited number of times, thus eliminating the possibility of erroneously identifying a counterfeit product as genuine. The verification process is performed using an electronic computing device having a graphics display, such as mobile phone, without any additional technical devices such as scanners or readers, or any additional software.

Background of the invention: document RU 2202127 C2 describes a method for distinguishing authentic goods from counterfeits, wherein the products are protected by a tag, which represents an information medium that has a random structural pattern and a code. However, the patent document refers to the ability to create the unique structural pattern by including particles of opaque or translucent material into the transparent material of the medium, wherein the location of such particles would be unique. The information about the medium is stored in the database. A consumer receives an image of the random structural pattern online or over the phone and compares it with the pattern of the identifier. The medium may be made of glass.

The document RU 2285954 C1 discloses a method for the protection of goods from counterfeiting. The disclosed method comprises a three-dimensional identifier attached to the product, containing randomly located optically visible elements. The digital reproduction of the identifier is entered into an electronic database. The identifier is made transparent. It may even be made by crushing of an opaque material and mixing it with and into the transparent material.

The document DE 10155780 describes the possibility of making a transparent plastic identifier with pieces of opaque material to create random patterns that are visible to the naked eye.

The disadvantages of the known methods for the verification of the authentic origin of the goods are as follows:

- A number of known methods require a consumer to use a special-purpose device (scanner, reader) or special software, which may not be in the possession of the consumer at the time of verification, thus preventing the consumer from performing the verification of the authenticity of origin of the product at the point of sale. Furthermore, the requirement to use such additional device or specialized software is conditioned by the fact that in the majority of instances described above, the structural patterns created with the use of the disclosed methods may not be reliably identified by the human eye due to the limitations of its resolution capabilities.
- The drawback of a number of the disclosed methods which do not require a separate device for scanning or reading the medium and provide for a visual comparison of the identifier with its graphic representation in the database, is the low reliability in the results of comparison due to the fact that consumers need to visually compare two optically complex objects: an identifier and its reproduction. For example, the downside of the method disclosed in RU 2285954 C1, is that the identifier is made three-dimensional, making it difficult to compare the identifier with its reproduction stored in the database by human eye without additional devices.

The disadvantage of all of the above-referenced methods is that none of them guarantees the uniqueness of the graphical pattern obtained. Each of them may be replicated in an artificial copy with a high degree of similarity, making it impossible for scanning devices or the naked eye to establish forgery.

The purposes of the invention are:

- Simplifying the method of manufacturing of the identifier with a unique pattern
- reducing the resources needed for the manufacturing of the identifier, i. e. cost reduction, time and special equipment required to manufacture the same;
- enabling reliable comparison of the unique crack pattern of the identifier with its corresponding electronic graphic representation stored in the database using the human eye without any additional technical means;
- reducing the number of procedures to be fulfilled by the user in order to verify the product;
- reducing the number of technical devices and software necessary for the user in order to identify the product;
- enabling multiple verification of the authenticity of origin of the same product without destroying the physical integrity of the product or the identifier;
- disabling the possibility of having the identifier replicated by other technical means.

The invention is based on known physical properties of amorphous materials, such as glass. The essential property of glass required for the implementation of the invention is the fact that glass always has internal tensions occurring in the process of glass production. The rapid cooling of heated glass results in that its outer layers cool faster than inner layers. The difference in temperature occurs as a result of the low thermal conductivity of glass. In materials with high of thermal conductivity, such as metal, the outer and inner layers cool down almost simultaneously and the temperature difference between them is negligible.

Uneven cooling down of the outer and inner layers of glass results in the occurrence of compression and expansion tensions. When the glass is fully cooled down and the temperature of different layers of glass is aligned, the tensions that occurred during the process of cooling down remain.

Inner tensions occur in the glass in the course of the transition of its state from elastic to brittle, i. e. when the glass particles gradually lose their mobility, up to the moment when the movement of the glass particle virtually reaches zero.

In the course of cooling down, the temperature in the outer layer of glass will reduce considerably faster than that of the inner layer. During the first moments of the process of cooling down, while plastic deformations are still possible, the outer layer reduces in volume. At the same time, the inner layer remains shrinkable and occupies the same volume as before. When the inner layer cools down further, it also seeks to shrink but meets strong resistance from the outer inelastic membrane. If there was a possibility, the inner layer would separate from the outer layer forming a gap between them. However, as the inner layer cannot come off in a cooled state, it is forced to take somewhat larger volume than would correspond to its temperature. This results in stretching tensions within the inner layer and compression tensions in the outer layer, as it is pulled inwards by the inner layer.

When a plate of glass is mechanically damaged, the cracks that form in it will follow the vectors of the compression and stretching tensions mentioned above. This creates a unique crack pattern in the plate.

Thus, the invention is based on the unique pattern of cracks in material, which becomes visible due to the destruction of material and optical refraction of light.

The purpose of the invention is achieved in the following way:

A device for the verification of the authenticity of origin of goods, which comprises of an identifier with a unique crack pattern and a unique code of such identifier. The identifier is made of a plate of transparent or translucent amorphous material, such as glass. A film of transparent elastic material is attached (for example, with glue) on one or two planes of the identifier plate. Alternatively, such an identifier plate may be placed in a transparent container. The unique graphic crack pattern in the identifier plate is created by hitting or pressing on the identifier with a solid body. The point of impact may be chosen at random. Moreover, there may be a few points of impact.

The use of the properties of amorphous materials described above allows achieving simplicity of manufacture of the identifier with the unique crack pattern.

Each identifier is assigned a certain unique code that is applied either to the identifier or on its enclosure. In one of the embodiments of the invention, it is also supplied with text, the barcode, or the QR code information with a web address at which the electronic graphic representation of the unique crack pattern of the identifier can be accessed for the purposes of verification.

As the next step, a record is entered into the electronic database containing information about the unique product identifier, comprising the graphic representation of the unique crack pattern of the identifier, its unique code and information regarding the product and its manufacturer.

According to one of the embodiments of the invention, before the information on the unique identifier is entered into the electronic database, a check is run to know whether a human eye is capable of distinguishing between the unique graphic pattern of such new identifier and those identifiers which have been registered in the database earlier. Such a check is performed using specialized software algorithm which compares the electronic graphic representation of the unique crack pattern of the new identifier with electronic graphic representations of crack patterns of all previously registered identifiers taking into account the resolution of the human eye. The information about the identifiers which the software found indistinguishable by the human eye from any of the previously recorded identifiers is not entered into the database and the corresponding physical identifiers are discarded. This is done in order to exclude the possibility of manufacture of two product identifiers, the graphic pattern of which would be impossible to distinguish by the human eye due to its resolution limitations.

After the identifier is attached to the product, information of the product is entered into the database and linked to the specific identifier attached to it.

The next stage of the method is to verify the authenticity of origin of the goods. Such verification is done by comparing the unique crack pattern of the identifier with its electronic graphic representation stored in the database under its unique code. Information about the product and the identifier stored in the database may be accessed via any electronic computing device with graphic display and internet connection.

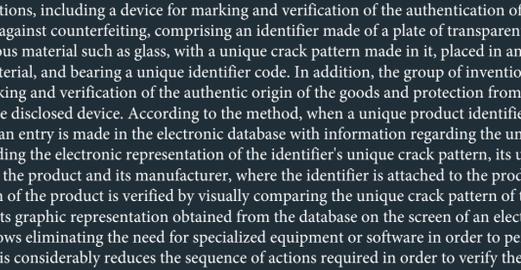
In order to verify the authenticity of origin of the product, the user enters the unique code specified on the product identifier in the web browser of an electronic computing device connected to the Internet on the website providing access to the information on unique product identifiers. As the result, the user obtains the electronic graphic image of the unique product identifier stored under the code, which image is displayed directly on the screen of the electronic computing device. The unique crack pattern of the identifier attached to the product is compared with electronic graphic representation stored in the database displayed on the electronic computing device by visually comparing the displayed electronic graphic image with a unique pattern of the identifier, placing it next to the electronic graphics image obtained from the database, or by placing it over the image directly on the screen of the electronic computing device.

The product is considered to be authentic when the electronic graphic representation of the identifier and the information regarding the product obtained from the database match the unique crack pattern of the identifier itself and the product to which it is attached.

According to one of the embodiments of the invention, the electronic graphic representation of the unique crack pattern of the identifier for the verification purposes is obtained by automatically directing the web browser using general-purpose software for the scanning of respective text, barcode, or QR code information to the page with electronic graphic representation of the identifier's unique crack pattern.

This way, the goal of minimizing the number of operations required for the user in order to verify the product and reducing the number of technical means required to perform such verification is achieved.

Example embodiment of the invention



The drawing Fig. 1 shows the identifier, which is made of a plate of glass (1) with a unique crack pattern (2) formed by an impact of a solid body on the plate. The film (3) is glued on both planes of the plate (1), preventing the disintegration of the pieces of the cracked glass plate. Unique identification number (4) is applied on the film (3). In addition, to make the product verification easier, the film (3) bears textual information with website address (5), at which the verification of the authentic origin of the product may be performed by entering the identifier unique code from keyboard, and the QR code (6), with the help of which the browser of the electronic computing device may be automatically directed to the unique web page with electronic graphic depiction of the identifier subject to verification.

The device described above may be manufactured using the existing industrial technologies and materials.

Abstract

Group of inventions, including a device for marking and verification of the authentication of origin of goods and protection against counterfeiting, comprising an identifier made of a plate of transparent or translucent brittle amorphous material such as glass, with a unique crack pattern made in it, placed in an enclosure of transparent material, and bearing a unique identifier code. In addition, the group of inventions comprises a method of marking and verification of the authentic origin of the goods and protection from counterfeiting that employs the disclosed device. According to the method, when a unique product identifier is manufactured, an entry is made in the electronic database with information regarding the unique product identifier including the electronic representation of the identifier's unique crack pattern, its unique code, the information on the product and its manufacturer, where the identifier is attached to the product. The authentic origin of the product is verified by visually comparing the unique crack pattern of the product identifier with its graphic representation obtained from the database on the screen of an electronic computing device. This allows eliminating the need for specialized equipment or software in order to perform verification. This considerably reduces the sequence of actions required in order to verify the authenticity of origin of the product.

More information on the official website of the [State Enterprise \"Ukrainian Institute of Intellectual Property\"](http://State Enterprise \).

If you would like to explore UATAG opportunity, please CONTACT US at info@uatag.com, or visit our website at www.uatag.com