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(54) **METHOD FOR SECURING A SECURITY DOCUMENT AND SECURITY DOCUMENT OBTAINED WITH THIS METHOD**

(57) The invention concerns a method for securing a security document (100) comprising:

- personal data pages (120) stitched together by means of an upper thread (131) and a lower thread (132) interlaced together, and

- at least one cover sheet (110) placed outside the personal data pages (120) and comprising at least one end paper sheet (112) stitched with the personal data pages and one cover material sheet (111) attached to the end paper sheet,

wherein, during security document manufacturing, a step of stitching reinforcement with at least one extra loop (135) reinforces interlacing (133) of the upper and lower threads.

The invention concerns also a security document (100) obtained with this method.

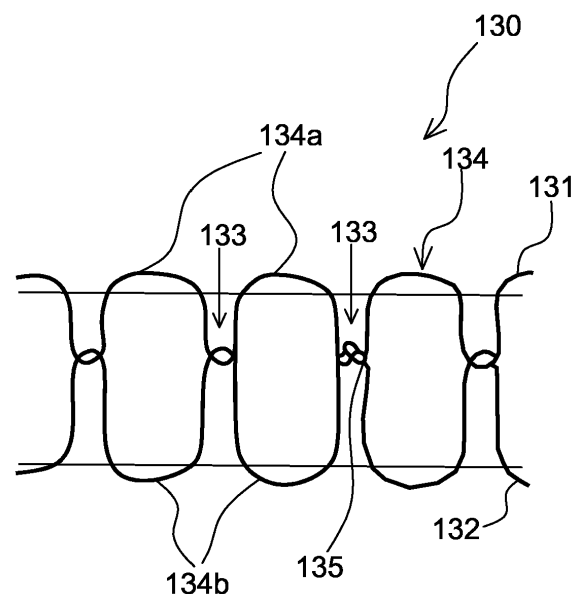


Fig.3

Description

FIELD OF THE INVENTION

[0001] The invention relates to a method for securing the stitching of a security document having the form of a booklet, in order to improve the tamper evidence and prevent the reuse of the thread attaching the booklet. The invention relates also to a security document, such as a passport booklet, obtained with this method.

[0002] The invention finds applications in the security field and, in particular, in the field of security documents having the form of booklets containing each one several pages, like passport booklets.

BACKGROUND

[0003] Security documents such as passport booklet are documents issued by a state to allow its citizens to travel abroad. These security documents, and passports in particular, are generally made up of various elements bound together as securely as possible in order to allow its holder to travel freely between states. They provide positive assurance that the identity is real and the person holding the document is correctly entitled to travel or enter a state. Lack of assurance based on poor quality of a document causes the traveller inconvenience as receiving states do not trust the document and conduct more checks or may impose visa regulations on the holder.

[0004] Passport booklets include generally a lot of security elements - such as guilloches, holograms, personalized markings, RFID chip, etc. - that allow an authentication of the passport holder. All the security elements are distributed in one or several pages of the passport booklet. However, passport booklets are the subject of numerous forgeries and counterfeits, notably by manipulation of the data contained in the pages. Most of the access to the data page(s) have security surrounding them in order to prevent this happening, mainly associated with the hinge technology. Indeed, forgers often try to detach the data page(s) from the rest of the booklet in order to insert counterfeit page(s).

[0005] To prevent these counterfeit and forgery activities, integrity in the booklet is a requirement by most states. Integrity preservation consists for example of preventing the access to the hinge, in particular to the stitching thread when the booklet is stitched. Indeed, as shown on figure 1, a passport 100 generally comprises a cover sheet 110 and personal data pages 120 stitched together, the cover sheet being attached outside pages 120. The personal data pages 120 comprise generally several paper data pages 121 and one bio data page 122, for example in the form of personalized data inserted in a polycarbonate (PC) data page. The cover sheet 110 comprises generally one or several end paper sheet(s) 112 and one cover material sheet 111 attached, for example glued, together in order to protect the stitching of the passport booklet.

[0006] However, this stitching protection is not sufficient for protecting the booklet integrity. Indeed, forgers may open the stitching, keep the thread unharmed and reuse it after having modified pages of the passport booklet.

SUMMARY OF THE INVENTION

[0007] In response to the above formulated problems of thread opening of the stitching by forgers, the applicant is proposing a method for securing passport booklets and other security documents by adding at least one reinforcing extra loop in the stitching.

[0008] According to a first aspect, the invention concerns a method for securing a security document comprising:

- personal data pages stitched together by means of an upper thread and a lower thread interlaced together, and
- at least one cover sheet placed outside the personal data pages and comprising at least one end paper sheet stitched with the personal data pages and one cover material sheet attached to the end paper sheet,

characterized in that it comprises, during security document manufacturing, a step of stitching reinforcement with at least one extra loop that reinforces the interlacing of the upper and lower threads.

[0009] Such a method allows, among other advantages, to secure the stitching of passport booklet so as the stitching cannot be opened keeping the threads unharmed.

[0010] In the description, the expressions "passport" or "security document" will designate in the same manner any document having the form of a booklet and containing security data specific to its holder.

[0011] Advantageously, the extra loop is formed with the upper thread so as to encircle the lower thread. Such an extra loop can advantageously be made with a usual sewing machine.

[0012] According to some embodiments, at least two extra loops are formed in the stitching and distributed over a length of the stitching. Several extra loops allow even better reinforcement of the stitching.

[0013] According to a second aspect, the invention concerns a security document comprising at least:

- personal data pages stitched together by means of an upper thread and a lower thread interlaced together, and
- at least one cover sheet placed outside the personal data pages and comprising at least one end paper sheet stitched with the personal data pages and one cover material sheet attached to the end paper sheet,

characterized in that it is obtained with the method defined above.

[0014] According to one or more embodiments, the stitching comprises a plurality of stitches and at least one extra loop between two consecutive stitches for reinforcing the interlacing of the upper and the lower threads.

[0015] According to one or more embodiments, the extra loop is formed by the upper thread and encircles the lower thread.

[0016] According to one or more embodiments, the stitching comprises at least two extra loops distributed over the length of the stitching.

[0017] According to one or more embodiments, the upper thread passes through the lower thread at the interlacing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] A detailed description of some preferred embodiments is set forth herein below with reference to the following drawings, in which:

FIG. 1, already disclosed, is a general view of a passport booklet according to the prior art;

FIG. 2 is a cross-sectional view of a passport booklet according to embodiments of the invention wherein the stitching of the passport booklet is reinforced;

FIG. 3 is an enlarged schematic view of a reinforced stitching portion with an extra loop according to the invention;

FIG. 4 is an enlarged schematic view of an upper thread with extra loops according to embodiments of the invention;

FIG. 5 is a schematic view of a reinforced stitching in a passport booklet according to the invention.

DETAILED DESCRIPTION

[0019] This description provides examples not intended to limit the scope of the appended claims. The figures generally indicate the features of the examples, where it is understood and appreciated that like reference numerals are used to refer to like elements. Reference in the specification to "one embodiment" or "an embodiment" or "an example" means that a particular feature, structure, or characteristic described is included in at least one embodiment described herein and does not imply that the feature, structure, or characteristic is present in all embodiments described herein.

[0020] The invention is proposing a method to prevent the opening of the stitching without any harm to the thread. This method may be implemented in any passport booklet of the type shown in FIG. 1. This method proposes to reinforce the sewing of said passport booklet with at least one extra loop within the stitches, during passport booklet manufacturing.

[0021] A cross-sectional view of an example of a passport booklet 100 according to the invention is represented

on figure 2. This figure 2 shows several personal data pages 120 sewn together and attached to the cover sheet 110 protecting said pages.

[0022] According to some embodiments, the personal data pages 120 comprise several paper data pages 121, like visa pages, and one or more bio data page(s) incorporating personalized data relative to the holder and security elements such as OVI patch, hologram, ghost photo, guilloches, etc. In the example of figure 2, the passport booklet 100 comprises two bio data pages : a first bio data page 122 in the form of a PC (polycarbonate) data page in which specific data relative to the holder and/or security elements are incorporated and a second bio data page 123 in the form of a paper data page in which specific data relative to the holder and/or security elements - similar or different from these of bio data page 122 - are incorporated. The first and second bio data pages 122, 123 are both sewn to the paper data pages 121 by means of a central stitching 130. Thus, the stitching 130 - called also sewing line - constitutes a central hinge allowing assembling of all the pages and opening/closing of the passport booklet.

[0023] According to the invention, the sewing line 130 of the passport booklet 100 comprises several consecutive stitches 134 and at least one extra loop 135 inserted in between these, as represented in figures 2 to 5. Figure 3, in particular, represents a part of a booklet sewing 130 with a few stitches 134 set consecutively to each other. The sewing line 130 is obtained by means of an upper thread 131 and a lower thread 132 interleaved together so as to create stitches 134 with interlacing 133 there between. Each interlacing 133 allows retention of the upper thread 131 by the lower thread 132, and inversely. Thus, each stitch 134 of the sewing line 130 is formed by one upper half-stitch 134a, provided by the upper thread 131, and one lower half-stitch 134b, provided by the lower thread 132 and linked to the upper half-stitch 134a by interlacing 133.

[0024] Figure 3 represents also one extra loop 135 inserted between two stitches 134. The extra loop 135 can be inserted in all stitching types generally used for passport manufacturing. It can, in particular, be inserted in a stitching such as this shown in figures 3 and 4. In this type of stitching, the extra loop 135 is made between two consecutive stitches 134, in an interlacing 133. Thus, no additional needle hole is created. Such extra loop 135 allows reinforcement of the interlacing 133 so as none of the threads 131, 132 be able to slide along the other thread 132, 131. Indeed, the extra loop 135 encircles one of the threads and provides an interweave that locks said thread so as no forger could open the stitching keeping the threads unharmed.

[0025] In the example of figure 3, the extra loop 135 is formed by the upper thread 131 which encircles the lower thread 132 above one of the interlacing 133. In other embodiments, the extra loop may be formed by the lower thread 132 encircling the upper thread 131. Whatever the thread forming the extra loop, said extra loop 135 pro-

vides interlocking of the upper and lower threads 131,132, preventing any forger of removing the stitching without damaging the threads. Indeed, in case of forger attack, the thread couldn't be separated from the booklet without being broken or frayed.

[0026] According to some embodiments wherein the extra loop 135 is formed by the upper thread 131, the lower thread 132 is at least partially attached, for example glued, to the cover material sheet 111. Therefore, the access to the sewing line 130 is not possible through the lower thread 132 without destructing first the cover material sheet. The access to the sewing line through the upper thread 131 is possible but the thread would be imperatively damaged because of the extra loop 135.

[0027] In the embodiments where the extra loop 135 is formed by the upper thread 131, it is possible that the needle driving the upper thread 131 passes through the lower thread 132 at the interlacing 133. In that case, the lower thread 132 would be split so that said thread will break, fully or partially, when a forger would try to unstitch the sewing line.

[0028] According to some embodiments, the sewing line 130 may comprise more than one extra loop 135, the extra loops being distributed over the length of said sewing line. When the sewing line 130 comprises only one extra loop 135, said extra loop may be positioned, for example, in the middle of the sewing line, that is at midway between the bottom (reference B in Figure 1) and the top (reference T in Figure 1) of the passport booklet. When the sewing line 130 comprises two extra loops 135, one of said extra loops may be set at one-third distance from the bottom B of the passport booklet and the other one at one-third distance from the top T of said passport booklet. When the sewing line 130 comprises three or more extra loops 135, these extra loops may be positioned regularly along the sewing line. On the opposite, in other embodiments, the extra loops are positioned irregularly along the sewing line 130.

[0029] Figure 4 represents an example of an upper thread 131 with several half-stitches 134a, provided to be combined each one with a lower half-stitch 134b. In this example, the sewing line 130 comprises two extra loops 135 distributed over the length of said sewing line, the first one being placed at about one-third from the top T of the passport booklet (between the bottom B and the top T), the second being placed at about two-third from the top T of said passport booklet.

[0030] As shown in figures 3 and 4, the extra loop 135 is a sort of ring formed with one of the threads - for example with the upper thread - between two consecutive upper half-stitches 134, and adapted to surround the other thread - for example the lower thread. The extra loops 135 improve the sewing line 130 and reinforce the security of the stitching while remaining invisible for the holder and any user. The fact of being invisible has not only the effect of not modifying the visual appearance of the sewing line 130 but also of making the forger attack even more difficult. An example of a sewing line with extra

loops, such as that of a passport booklet according to the invention, is represented in figure 5. As we can see in this figure 5, the extra loops are invisible, only their reference 135 allows to know where are both extra loops 135.

[0031] Each extra loop(s) 135 as previously disclosed could be produced by a classical sewing machine. Indeed, each sewing machine able to stitch passport booklets, and in particular stitches 134, is able to produce the extra loops 135. Existing machinery can thus be used. Only a software modification of the sewing machine is necessary for producing the extra loop(s) within the stitching 130.

[0032] While only some selected embodiments have been chosen to illustrate the present invention, it will be apparent to the skilled person from this disclosure that various changes and modifications can be made herein without departing from the scope of the invention as defined in the appended claims. The structures and functions of one embodiment can be adopted in another embodiment. Further, it is not necessary for all advantages to be present in particular embodiments at the same time.

Claims

1. Method for securing a security document (100) comprising:

- personal data pages (120) stitched together by means of an upper thread (131) and a lower thread (132) interlaced together, and
- at least one cover sheet (110) placed outside the personal data pages (120) and comprising at least one end paper sheet (112) stitched with the personal data pages and one cover material sheet (111) attached to the end paper sheet,

characterized in that it comprises, during security document manufacturing, a step of stitching reinforcement with at least one extra loop (135) that reinforces interlacing (133) of the upper and lower threads.

2. Method according to claim 1, wherein the extra loop (135) is formed with the upper thread (131) so as to encircle the lower thread (132).

3. Method according to claim 1 or 2, wherein at least two extra loops (135) are formed in the stitching (130) and distributed over a length of the stitching.

4. Security document (100) comprising at least:

- personal data pages (120) stitched together by means of an upper thread (131) and a lower thread (132) interlaced together, and
- at least one cover sheet (110) placed outside

the personal data pages (120) and comprising at least one end paper sheet (112) stitched with the personal data pages and one cover material sheet (111) attached to the end paper sheet,

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characterized in that it is obtained with the method according to any of claims 1 to 3.

5. Security document according to claim 4, wherein the stitching (130) comprises a plurality of stitches (134) and at least one extra loop (135) between two consecutive stitches (134) for reinforcing the interlacing (133) of the upper and the lower threads (131, 132). 10
6. Security document according to any one of claims 4 to 5, wherein the extra loop (135) is formed by the upper thread (131) and encircles the lower thread (132). 15
7. Security document according to any one of claims 4 to 6, wherein the stitching (130) comprises at least two extra loops (135) distributed over the length of the stitching. 20
8. Security document according to any one of claims 4 to 7, wherein the upper thread (131) passes through the lower thread (132) at the interlacing. 25

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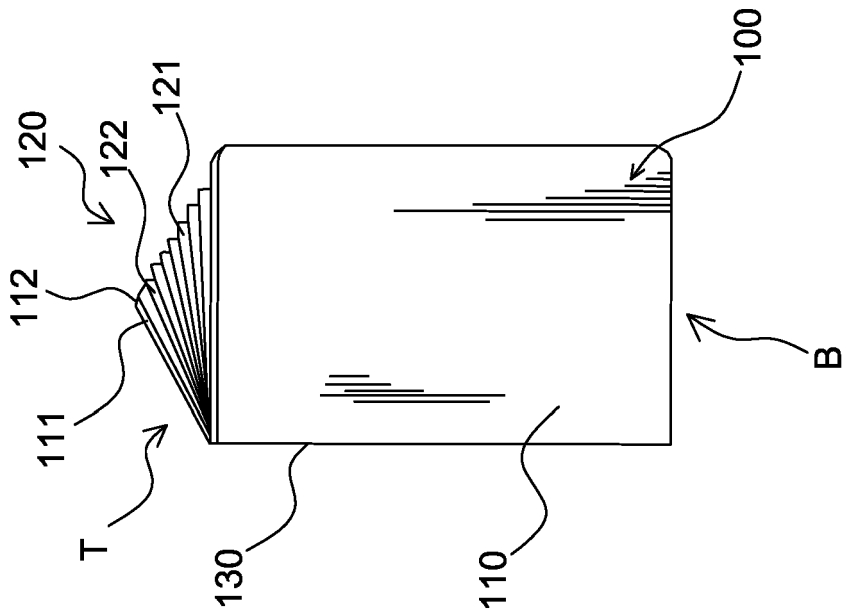


Fig.1

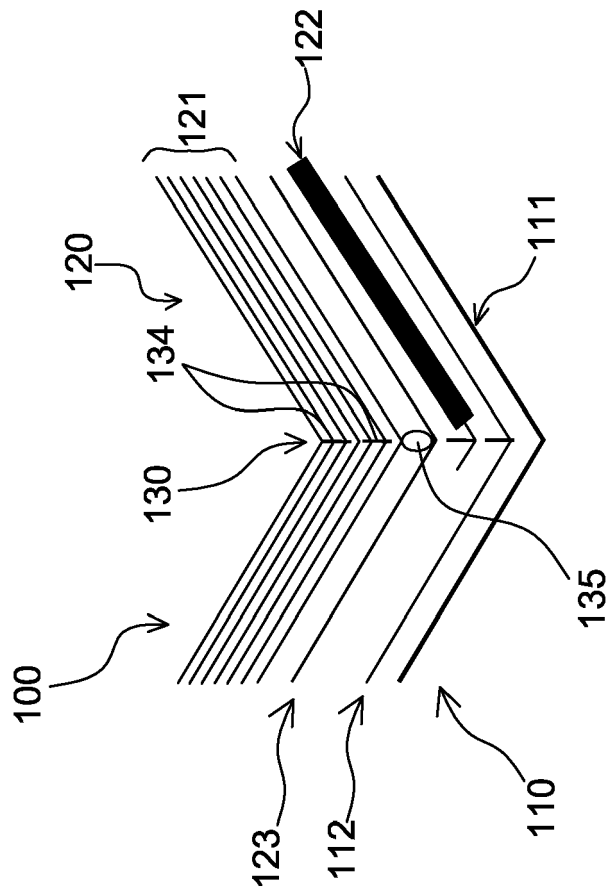


Fig.2

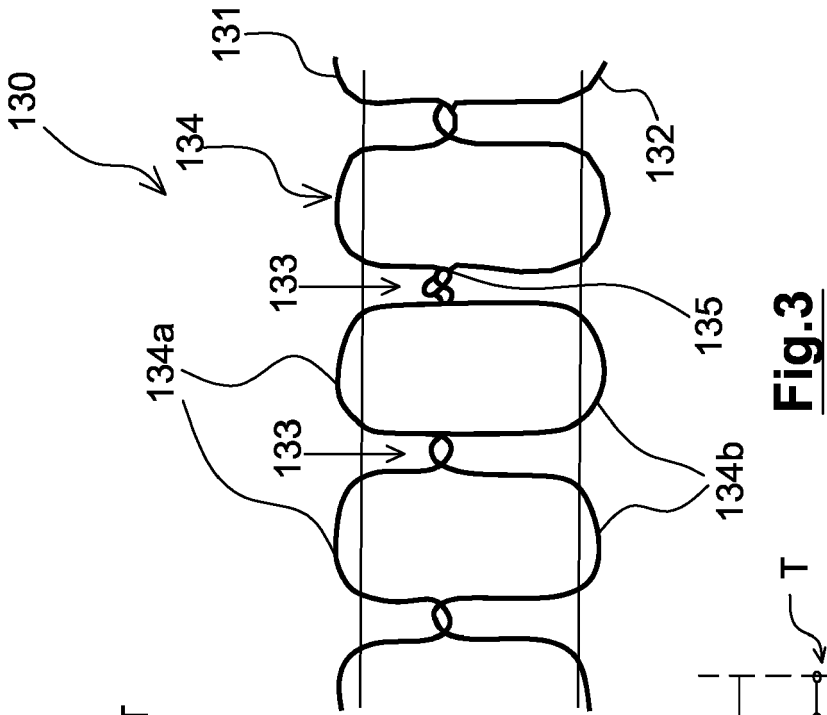


Fig.3

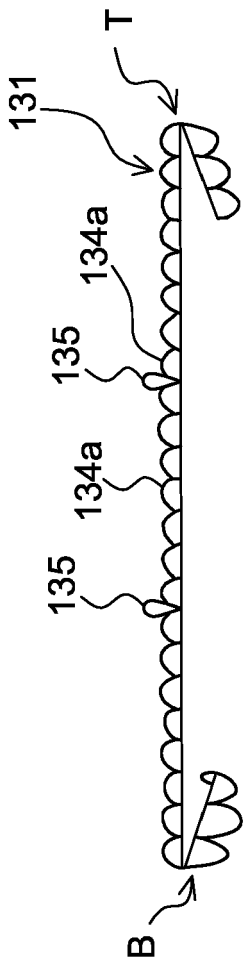


Fig.4

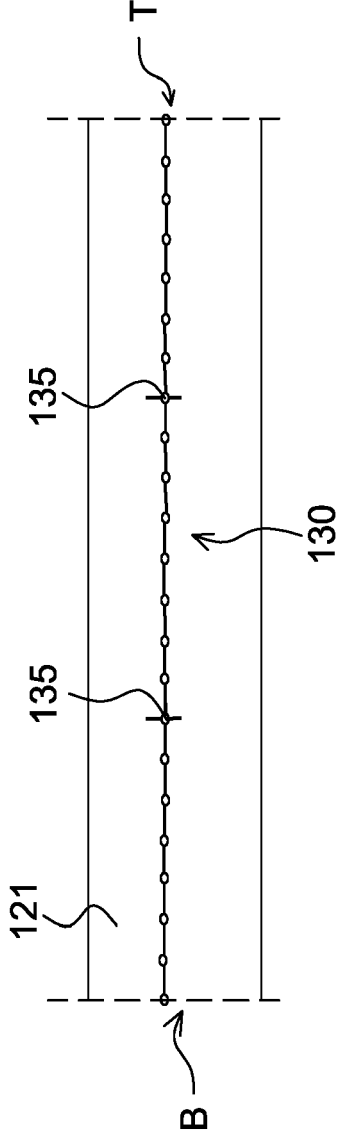


Fig.5



EUROPEAN SEARCH REPORT

Application Number
EP 19 30 6616

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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	CA 2 091 109 A1 (CANADIAN BANK NOTE CO LTD [CA]) 6 September 1994 (1994-09-06) * page 3, line 18 - page 4, line 26; figure 2 *	1-8	INV. B42B2/00 B42D25/24 B42D25/45
X	DE 188 523 C (KETTLE SWITCH MACHINE COMPANY) 12 September 1907 (1907-09-12) * page 1, line 63 - page 2, line 36; figures 1-3 *	1-8	
X	DE 79 744 C (J. FUNCKE) 9 February 1895 (1895-02-09) * page 2, line 17 - line 66; figures 3, 24-28 *	1-8	
			TECHNICAL FIELDS SEARCHED (IPC)
			B42B B42D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 May 2020	Examiner Achermann, Didier
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07-05-2020

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DE 188523	C	12-09-1907	NONE
DE 79744	C	09-02-1895	NONE

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