

INTELLECTUAL PROPERTY OFFICE OF SINGAPORE  
PATENT AGENTS QUALIFYING EXAMINATION 2019

**PAPER B: AMENDMENT OF A PATENT SPECIFICATION**  
**3 December 2019, Tuesday**  
**1330 – 1730 hrs**

Maximum Time: 4 Hours (includes reading time)

Maximum Marks: 100



**INSTRUCTIONS TO CANDIDATES**

1. This Question Paper consists of 36 pages, including this cover page.
2. Type your answers in English. Answers in any other language will not be marked.
3. You are given one hard copy of the Question Paper. The soft copy of the Question Paper is also provided in the given laptop.
4. Only answers and/or drawings typed or indicated in the Answer Script template provided by the Examination Secretariat will be considered. Candidates should not change the given format of the Answer Script or type in the margin.
5. The information provided in the Question Paper may be obtained from actual situations or modified therefrom for the purpose of this examination. You should accept the facts given in the paper and assume that the prior art given is exhaustive.
6. For the purpose of this examination, you do not need to propose any amendments to the description of the Patent Application.
7. The documents provided in this Question Paper are:
  - a. Cover Page (1 page);
  - b. Document A: Letter from Client (1 page);
  - c. Document B: Secure Packaging (12 pages including drawings);
  - d. Document C: Examination Report / Written Opinion (3 pages);
  - e. Document D1: EP 2 222 222 (6 pages including drawings);
  - f. Document D2: SG 1020162222X (9 pages including drawings); and
  - g. Document D3: SG 10201112345G (4 pages).

**END**

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**Document A: Letter from Client (1/1)**

Dear Patent Attorney,

I received the Examination Report with a Notice of Intention to Refuse Patent Application and Establishment of Report without Response to Written Opinion, both letters  
5 dated 6 October 2019. I was surprised to see this and when I checked my file, I realised that you did send me a written opinion in May but I thought that the written opinion was for the corresponding application which was only filed in the United States that I wanted to give up and forgot about it. Does this mean that my application is dead and there is no way I can continue with this application?

10 I would very much like to continue with this application as I believe that my invention is very useful. While I like it that the Examiner did say that claim 15 is novel and inventive, this feature is too narrow and I do not want it to be added to the main claims. I believe that my invention can still be claimed broadly and this has to do with how the packaging material is made which allows the security feature to be read without risk of being damaged or removed.  
15 Please draft something along these lines for my review and briefly explain the rationale behind your amendments with reference to the prior art documents cited.

After I filed this application, I went on a packaging conference in the Europe and saw a packaging material there that has the same exact features as my packaging material. Is there anything that I can do against this supplier in Europe? I also learnt that this supplier is  
20 now in Singapore and has started selling the exact same packaging material as me. I want to sue this supplier now, can I? What can I do to this supplier to prepare for my Court case?

My researchers informed me that they have come up with a new type of security feature where they used metallic discs, rather than tapes or fibers. Since the metallic discs are harder than the tapes or fibers, this provides an additional strength advantage to the packaging and  
25 also ensures that the metallic discs are not damaged during transportation so that the metallic discs can still be repeatedly verifiable and form an integral part of the blank material. Can you let me know if the claims will cover the metallic discs? If I want to claim these metallic discs, what should I do?

Please help me.

30 Natalie Wang, CEO, Love of Packaging Limited

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**Document B: Secure Packaging (1/12)**

**Technical Field**

[001] This invention relates to a blank for security packaging and the manufacture thereof, in particular to the addition of a security feature into packaging so as to form an integral part thereof.

**Background**

[002] A number of industries, especially those involving luxury products such as perfume, experience counterfeiting and theft problems which result in loss of millions each year. Usually, counterfeiters will focus on making their packaging as real as possible so as to mimic the actual packaging. Often-times, when a consumer buys a luxury product, if the packaging looks like the real packaging, the consumer will tend not to check the goods inside especially if the packaging looks to be unaltered or not tampered with. In addition, where a consignment of genuine products is stolen and re-sold in another part of the world, the original proprietors have no means of tracing where it originally came from. This has led to difficulties in tracing where the theft occurred. In such situations, luxury brand owners not only suffer financial loss, but also their brand and prestige will be affected by such counterfeiting and theft. The consumers may also lose confidence in the luxury brands if such counterfeiting and theft are not dealt with efficiently.

[003] Although a number of tamper evident features exist and have been used before in packaging, none of these provide any guarantee of authenticity.

[004] Most products now sold on the market include on their packaging a bar code which can be machine-read and provide information on what the product is. However, as such bar codes themselves can be counterfeited, they do not solve the problem of counterfeit products. In addition, such bar-codes are usually applied onto packaging using labels, which can be removed easily using solvents. Further, such bar-codes are provided on the surface of the packaging, which, like other surface-based security features, face issues with readability. As these security features can only be read from the surface of the packaging, if a packaging label is placed over the security feature or if a part of the packaging that contains the security feature is accidentally torn away, which can occur during transportation, the security feature can no longer be read.

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**Document B: Secure Packaging (2/12)**

[005] It is therefore an object of this invention to provide a packaging having security features and a method of making the same which reduces or ameliorates one or more of the problems above.

[006] It is also an object of this invention to provide a method of making a packaging having security features which reduces or ameliorates one or more of the problems above.

**Summary**

[007] According to one aspect, there is provided a blank for a counterfeit resistant security package made from a substantially rigid material comprising at least one authenticating security feature which is repeatedly verifiable without causing damage to the material, or without causing damage or a permanent change to the security feature itself, wherein said at least one security feature forms an integral part of the material of the blank such that it cannot be separated from the material without the destruction of the material and/or the at least one security feature.

[008] Advantageously, by having the authenticating security feature as one which is repeatedly verifiable without causing damage to the material, or without causing damage or a permanent change to the authenticating security feature itself, this ensures that the package can be verified during transportation at various checkpoints. Therefore, if a package is stolen at a particular checkpoint, this can be determined by comparing the number of packages that arrived at this checkpoint compared to the previous checkpoint. Therefore, the authenticating security feature allows transportation personnel or the brand owners the ability to verify the product without having to open the packaging.

[009] Further advantageously, by having the authenticating security feature forming an integral part of the material of the blank such that the authenticating security feature cannot be removed from the material without the destruction of the material and/or the security feature, this provides confidence to the consumer that the package was not tampered with.

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**Document B: Secure Packaging (3/12)**

[010] According to another aspect, there is provided a counterfeit resistant security package comprising a container made from a blank as defined herein.

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[011] According to another aspect, there is provided a method of making a counterfeit resistant security package as defined herein comprising the steps of forming a sheet of substantially rigid material comprising at least one authenticating security feature which is repeatedly verifiable without causing damage to the material, or without causing damage or a permanent change to the security feature itself, wherein said at least one security feature forms an integral part of the material of the blank such that it cannot be separated from the material without the destruction of the material and/or the at least one security feature.

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[012] Advantageously, the method may be inexpensive, easily scalable and require fewer steps as compared to conventional processes of forming security packages.

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**Brief Description of Figures**

[013] Fig. 1 is a perspective view of a security packaging according to the present invention.

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[014] Fig. 2 is a blank used in the manufacture of the security packaging of Fig. 1.

[015] Fig. 3 is an enlarged view of a section of a micro printed film for use in the manufacturing of a security thread for the security packaging of Fig. 1.

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**Detailed Description**

[016] Referring to Fig. 1 and 2, there is shown a security package 10 in the form of a box-shaped carton. Here, the package 10 has four side walls 11 and two end walls 12. The end walls 12 have additional flaps 13 that are folded inside and help to keep the package 10 to maintain its shape when assembled and closed. A glue flap 14 is provided along the edge of one of the side walls 11.

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[017] The security package 10 has an authenticating security feature. One example of such a security feature is illustrated in Fig. 1 as a micro printed security thread 15 exposed at intervals in windows 16 in the surface of the package 10. The authenticating security feature forms an integral part of the material of the package 10 itself such that it cannot be removed from the package 10 without the destruction of the material of the package 10 or the authenticating security feature itself. Thus, an attempted removal of the authenticating security feature is evidence of tampering. The authenticating security feature also provides confirmation of the authenticity of the package 10 in that it either cannot be counterfeited or forged or it is so expensive and/or difficult to do so, that an aspiring counterfeiter would not attempt to do so. The authenticating security feature can also be repeatedly verifiable as needed without causing damage to the material, or without cause damage or a permanent change to the authenticating security feature itself.

[018] The material for making the security package 10 can be made by a laminating process, laminating two or more substrates together to form an integral sheet. The first substrate is a backing substrate and can be made from a substantially rigid material, such as a folding box board, having an exemplary thickness in the range 100 to 1000µm. It is possible, however, that the range could be as wide as 10 to 2000µm for some applications. The second substrate is a security paper having the authenticating security feature. The security paper may have a density in the range of 50-150 gsm.

[019] The authenticating security feature used in the security package of Fig. 1 is exemplified as a security thread which is present on or within the security paper. The security thread is shown in Fig. 1 as being exposed at regular intervals through the windows 16 that are cut into the backing substrate such that the windows 16 can be seen at the surface of the package 10. To ensure that the security feature is not exposed to the environment and be tampered with, the regions of the windows are covered with a protective film such as a plastic film or sheet that is part of the backing substrate. Therefore, the backing substrate here would include the protective film. A range of fibre types can be used in the making of such security paper, including synthetic or natural fibres or a mixture of both.

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**Document B: Secure Packaging (5/12)**

[020] The security paper substrate may be independently made and subsequently laminated to the backing substrate in order to form an integral sheet. This generally involves the use of an adhesive such as polyvinyl alcohol/starch. However, the adhesive and the lamination process must be selected such that the lamination results in an integral sheet of material, the original substrates of which cannot be separated without damaging at least the security paper substrate. Since the authenticating security feature present on the security paper substrate is contacted with the backing substrate during the laminating process, the authenticating security feature is embedded within the integral sheet during manufacture of the integral sheet. Where windows in the backing substrate are present, the authenticating security feature has to line up with the protective film forming the windows before the laminating process, such that during the laminating process, the authenticating security feature is similarly embedded within the integral sheet during manufacture of the integral sheet and can be viewed through the protective film making up the windows.

[021] It should be noted that although references have been made to the use of one security paper substrate and one backing substrate, other combinations can be used, such as two security paper substrate and one backing substrate, with the two security paper substrates applied on both sides of the backing substrate.

[022] Once the integral sheet has been prepared, usually in the form of a continuous web, it is cut into at least one discrete sheet (also termed as a “blank”). Therefore, the material making up the blank is the integral sheet, when cut. Depending on the requirement of the security package, the blank may or may not be printed by the package manufacturer. Fig. 2 shows a carton blank 17 where in the printing process, the package decoration, product information, a bar code and the fold lines are printed. The carton blank 17 is then assembled to form the package 10, where the assembly can be done either by machine or hand. Adhesive is applied to the glue flap 14 which adheres to the inner surface of the free edge 18 of one of the side walls 11.

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**Document B: Secure Packaging (6/12)**

[023] The security paper substrate may be formed without any authenticating security features, and the authenticating security feature or features may be incorporated in the adhesive used to laminate the security paper substrate to the backing substrate during the laminating process. In addition, the security feature can be considered to be embedded within the adhesively laminated substrates (such as the security paper substrate and the backing substrate), leading to the security feature being fixed in place.

[024] The security paper substrate may also cover only a portion of the package such that the material of the package is only partially laminated.

[025] A wide range of different types of authenticating security features can be used in the present invention, such as coloured threads, metallised threads, de-metallised threads, holographic threads, security features that respond to fluorescent or infrared light, magnetic features, radio-frequency encoded threads or circuits. A security package according to the present invention may thus employ a plurality of authenticating security features which may all be the same, or which may be different.

[026] The at least one authenticating security feature may be visible to the eye and/or detectable by touch and/or machine-readable. The at least one authenticating security feature may become visible when subjected to a change in temperature and/or when subjected to infrared or fluorescent light. The at least one authenticating security feature may be encoded or may be encodable.

[027] All of these features can be used to authenticate the package without having to destroy or damage the package and without damaging or causing a permanent change to the authenticating security feature, so that it can be used repeatedly for its authentication purpose. It should also be noted that normal opening of the package does not destroy or permanently change the authenticating security feature.



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**Document B: Secure Packaging (7/12)**

[028] The location of such an authenticating security feature or features may again depend on the feature selected, the ultimate use of the package 10, its final appearance and the manufacturing process. As shown in Fig. 1, a security thread 15 within the blank may be positioned to run lengthways along one of the side walls 11. Alternatively, authenticating security features could be applied within the portion of the blank designated as the glue flap 14 such that the authenticating security feature is hidden once the package 10 is assembled. A machine would then be required to read the hidden feature. Therefore, the authenticating security features that were formed within the blank during the manufacture of the blank may be exposed or be hidden, such as when sandwiched between two sections, on the lid, the sides, the ends or an internal flap.

[029] The unique identifier can be randomly generated. The unique identifier can be generated before the authenticating security feature is applied onto or within the security paper substrate. The at least one authenticating security feature may be provided with the unique identifier after its addition onto or within the security paper substrate.

[030] One method of generating the unique identifiers is to use a windowed security thread 15. The threads are made by taking a web 21 of security film material (see Fig.3) and micro printing a code 22 comprising, say, a series of offset strings of letters. The web 21 is then slit along the lines 23 to create a plurality of the security threads 24 such that the strings of letters making up the micro printed code 22 on each resulting thread 24 is out of register. The one or more security threads is then added onto or within into the security paper substrate.

[031] Thus, although the letters themselves are in exact register, the security paper manufacturer has no control over where and at what point the thread 24 is fed into the paper making machine to form the thread 24 on the security paper substrate or where the windows 16 will occur relative to the code on the thread 24. Furthermore, the size and shape of the bridges 25 between the windows 16 and the windows 16 themselves are not exactly the same. Thus, what appears in each window is random. The randomness can be increased by applying an image, such as a holographic image, to the web 21 before it is micro printed or by designing the windows tube out of register with the image repeat.

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[032] This type of random encoding can be used on de-metallised or holographic thread.

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[033] In an alternate embodiment, the security package 10 of Fig. 1 can be provided without the windows 16 such that the authenticating security feature cannot be seen when viewing the security package 10. The backing substrate is then a complete piece without any holes and protective film, allowing for the security feature to be embedded within the integral sheet during manufacture of the integral sheet. The authenticating security feature will require the use of scanners or hand-held detection devices in order to read the encoded security feature embedded within the security package 10 at each delivery checkpoint.

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[034] The scope of the invention is now defined by the appended claims.

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**Document B: Secure Packaging (9/12)**

Claims

1. A blank for a counterfeit resistant security package made from a substantially rigid material comprising at least one authenticating security feature which is repeatedly verifiable without causing damage to the material, or without causing damage or a permanent change to the security feature itself, wherein said at least one security feature forms an integral part of the material of the blank such that it cannot be separated from the material without the destruction of the material and/or the at least one security feature.

2. The blank for a counterfeit resistant security package according to claim 1, wherein the at least one security feature is encodable.

3. The blank for a counterfeit resistant security package according to claim 1 or 2, wherein the material of the blank comprises a plurality of substrates laminated together to form an integral sheet.

4. The blank for a counterfeit resistant security package according to any one of claims 1 to 3, wherein said plurality of substrates comprises one security paper substrate.

5. The blank for a counterfeit resistant security package according to any one of claims 1 to 4, wherein said plurality of substrates comprises one backing substrate.

6. The blank for a counterfeit resistant security package according to claim 1, wherein said plurality of substrates are laminated together by means of an adhesive.

7. The blank for a counterfeit resistant security package according to any one of claims 1 to 6, wherein the at least one security feature has a unique identifier.

8. The blank for a counterfeit resistant security package according to claim 7, wherein said unique identifier is a randomly generated unique identifier.

9. A counterfeit resistant security package comprising a container made from a blank according to any one of claims 1 to 8.

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**Document B: Secure Packaging (10/12)**

10. A method of making a counterfeit resistant security package comprising the steps of forming a sheet of substantially rigid material comprising at least one authenticating security feature which is repeatedly verifiable without causing damage to the material, or without causing damage or a permanent change to the security feature itself, wherein said at least one security feature forms an integral part of the material of the blank such that it cannot be separated from the material without the destruction of the material and/or the at least one security feature.

11. The method according to claim 10, further comprising the step of laminating a plurality of substrates together to form said integral sheet of said material.

12. The method according to claim 11, further comprising the step of making a security paper containing said at least one security feature to form a first substrate.

13. The method according to claim 11 or 12, further comprising the step of providing a backing substrate as a second substrate.

14. The method according to claim 12, wherein said at least one security feature is encoded with a randomly generated unique identifier before said at least one security feature is added onto or within into the security paper.

15. The method according to claim 14, wherein said security feature is encoded with a randomly generated unique identifier after addition onto or within said security paper.

16. The method according to claim 15, wherein said unique identifier is generated by applying a plurality of offset strings of letters to a web of security film material, slitting the web to form a plurality of security threads out of register with the strings of letters and incorporating one or more of said security threads into the security paper substrate, such that the thread is exposed at intervals in windows in a surface of the material.

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**Document B: Secure Packaging (11/12)**

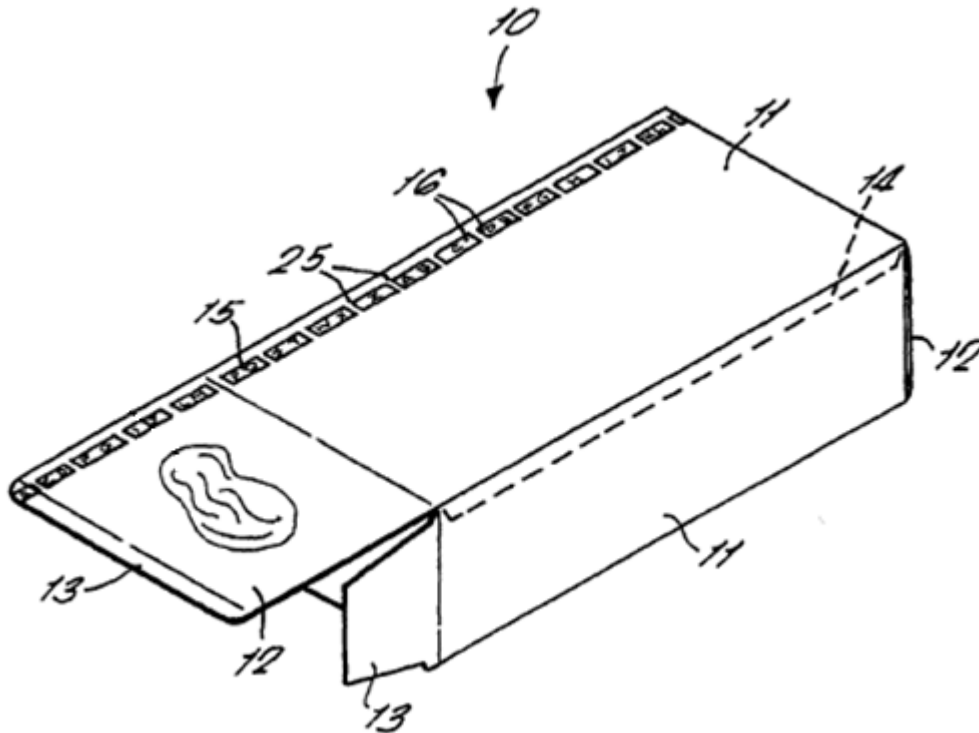


Fig. 1

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**Document B: Secure Packaging (12/12)**

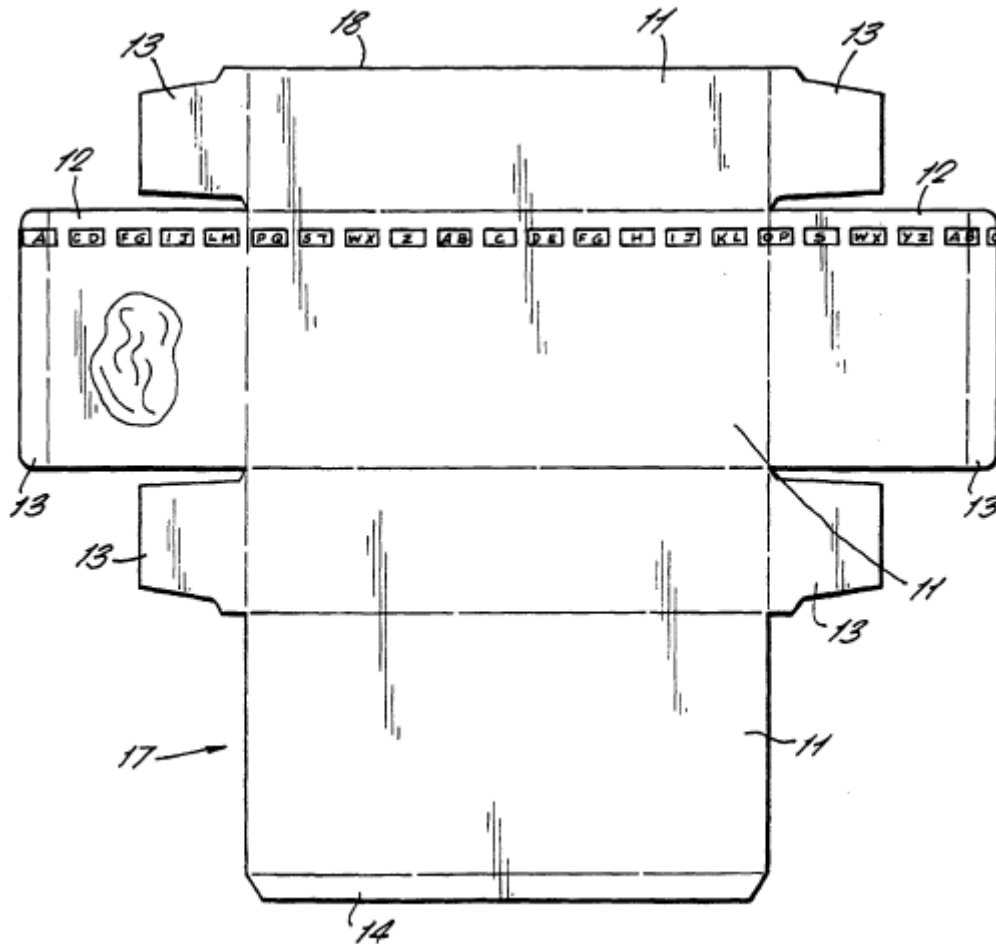


Fig. 2

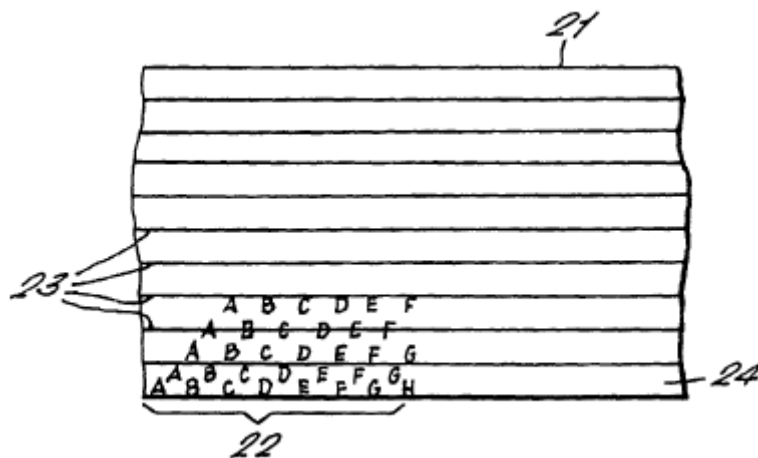


Fig. 3

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**Document C: Examination Report / Written Opinion (1/3)**

**Examination Report**

**Application No.**  
**10201811111A**

Application filing date 30 May 2018	(Earliest) Priority Date 30 May 2017
	Applicant's or agent's file reference PPPPPPPP
International Patent Classification (IPC) (as indicated in the search report): B65D 5/42	
Since there was no response to the written opinion issued on 2 May 2019, the written opinion is attached and will be treated as the Examination Report for this patent application.	
Date of submission of the request to IPOS INTERNATIONAL PTE. LTD: 10 December 2018	Date of Examination Report: 6 October 2019
IPOS INTERNATIONAL PTE. LTD  Paya Lebar Quarter	

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**Document C: Examination Report / Written Opinion (2/3)**

**Written Opinion**

Application No.

**10201811111A**

Application filing date 30 May 2018	(Earliest) Priority Date 30 May 2017	Examiner's Reference Number IPOS/AAA
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1. This first Written Opinion is issued under Section 29(5) of the *Patents Act* with effect from 30/10/2017.
2. The priority application has been examined and the present application validly claims priority to the priority application.

**Statement with regard to novelty, inventive step or industrial applicability**

Novelty (N)	Claim(s)	<u>15</u>	YES
	Claim(s)	<u>1 to 14, 16</u>	NO
Inventive Step (IS)	Claim(s)	<u>15</u>	YES
	Claim(s)	<u>1 to 14, 16</u>	NO
Industrial Applicability (IA)	Claim(s)	<u>1 to 16</u>	YES
	Claim(s)	<u>NONE</u>	NO

**1. Citations:**

D1 – EP 2 222 222

D2 - SG 10201622222X

D3 – SG 10201112345G

**2. Novelty (Section 14 of the *Patents Act*)**

D1 describes a counterfeit resistant security package (1) made from a substantially rigid material comprising at least one authenticating security feature (7,7a,7b) whereby the security feature (7,7a,7b) is repeatedly verifiable without causing damage to the material, or causing damage or a permanent change to the security feature itself, and in that said at least security



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feature forms an integral part of the material of the package, such that it cannot be separated from the material without the destruction of the material and/or the at least one security feature.

The only difference between the subject matter of claim 1 and the disclosure of D1 is that claim 1 is directed to a blank for forming a package. However, the carton package disclosed in D1 would also have to be formed from a blank and since the security feature is applied as part of a coating to the carton material, D1 implicitly discloses the blank according to claim 1. Therefore, claims 1 to 14 and 16 lack novelty.

In addition, D2 (see paragraphs [010] and [011]) and D3 (see paragraphs [005] to [007], [010] and [011]) also disclose a blank according to claims 1 to 14 and 16.

With regard to claim 15, since none of the prior art documents disclose the features of claim 16, claim 15 is thus novel.

**3. Inventive Step (Section 15 of the *Patents Act*)**

As the claims 1 to 14 and 16 are not novel, they are also not inventive, whether considering the cited documents singly or when combined with each other.

**4. Industrial Applicability (Section 16 of the *Patents Act*)**

The present invention can be used in industry, thus, claims 1 to 16 are industrially applicable.

**5. Clarity and Support (Section 25(5)(b) and Section 25(5)(c) of the *Patents Act*)**

Throughout the claims, there is a reference to “it”, it is unclear what this “it” refers to.

Claims 4, 5, 6, 11 and 15 appear to have antecedence issues.

Claim 10 appears to be incomplete and does not contain all the essential features.

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**Document D1: EP 2 222 222 (1/6)**

Priority date: 5 September 2012

Filing date: 4 September 2013

Publication date: 5 March 2014

**A Cardboard Packaging**

5           [001]    The invention relates to a cardboard packaging with a label, to facilitate the discovery and identification of counterfeits. In addition, the invention includes markings that allow the discovery of unscheduled distribution channels.

10           [002]    Traditionally, markings are affixed to carton packaging to identify original goods or a particular product, which can be done by using labels or by attaching the markings. However, such markings can be easily copied or removed by counterfeiters so as to pass off the cheap goods as the original products.

15           [003]    It is therefore an object of this invention to provide a cardboard packaging with a label that is easy to apply and without any special effort and easy to control, but is difficult or impossible for counterfeiters to imitate. To achieve this object, the invention provides a marking on the surface of the cardboard packaging that is made from a UV light substance that becomes visible only when irradiated with ultraviolet light. Such UV light substance can be a liquid agent on the cardboard material.

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          [004]    The solution according to the invention has the advantage that it uses a marking that is invisible to the naked eye on the cardboard packaging, which consequently also cannot be perceived by persons who intend to forge the goods and therefore will not be able to forge the original marking on the cardboard packaging.

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          [005]    Another very important advantage of the invention is that the invisible marking cannot be copied using a scanner because the scanner is not able to detect the invisible marking.

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**Document D1: EP 2 222 222 (2/6)**

[006] The marking can be produced directly on the cardboard material by mere application of a substance, in particular a liquid chemical agent, by dyeing or painting the cardboard material of the carton packaging. The liquid agent can be applied to virtually any point of the carton packaging. The liquid agent is applied after the goods are packaged into the carton packaging. Preferably, the marking consists of letters, numbers, glyphs, or the like, which contain certain information.

[007] There are many ways by which the marking can be applied to the cardboard material. In one example, the pigments of a substance which is only visible in UV light are mixed in a lacquer used for the inscription of cardboard material and applied when the cardboard packaging or the cardboard material is inscribed. The marking can then be detected using a UV light source.

[008] The developments of the invention by spectral selection by means of UV color filters and / or color filters and / or suitable UV light sources can individually or collectively be contained in the marking on the cardboard packaging. In the following, some particularly preferred variants are to be shown.

[009] For example, it is possible that the marking on one hand consists of a specific number and / or letter sequence, which is applied and recorded accordingly by the manufacturer, packer or distributor, and on the other hand additionally recorded in the appropriate protocol, which spectrally selecting UV color filters and / or color filter to be used when irradiating this marking with UV light. In this way, markings that have yet been discovered by counterfeiters can be used to get an advantage in time before the counterfeiters catch on.

[010] By way of example, where the marking uses a number sequence, the UV color filters, the color filters and the perceived color sense impression are each assigned a type number. If all these details are recorded by the authorized sender of the identification, a counterfeiter in order to imitate the thus protected identification must not only imitate the sequence of numbers but also imitate each individual digit in such a way that when the

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counterfeit identification is checked using the predefined protocol, must ensure that the marking produces the correct color sense impressions as defined in the protocol. This will only be possible if the counterfeiter analyzes each individual component of the marking by a complex chemical analysis in order to determine the dye or dyes used. A forgery of such a protected marking is thereby extremely expensive and tedious to copy.

[011] The invention will now be defined by two embodiments below.

[012] Fig. 1 is a purely schematic perspective view of a cardboard packaging in box form. As shown in Fig. 1, there is shown a box carton 1 where a marking 7, which consists of the letters and numerals "OP8" is applied using a liquid agent that is visible only in UV light. The visualization is carried out by a purely schematically indicated UV light source 5, which emits UV light rays 6, so that the marking 7 lights up and the "OP8" is clearly perceptible.

[013] FIG. 2 is a cross-sectional view of region A of the packaging of FIG. 1. Fig. 2 shows the constituent of the marking 7 on the surface of the box carton 1. The marking 7 of Fig. 1 consists of color pigments 4, which is mixed in an invisible liquid and applied with this adhering to the outer surface 2 of the cardboard material 3. After the liquid has dried, the region of the marking 7 cannot be distinguished from the adjacent regions of the outer surface 2 of the cardboard material 3. In UV light, however, the color pigments 4 light up, so that the marking 7 becomes clearly perceptible and visible.

[014] Fig. 3 is a purely schematic perspective view of a second embodiment of a carton in box form. In Fig. 3, a second embodiment of a cardboard packaging according to the invention is shown, in which spectral selection is used. The cardboard packaging 1 carries a multipart marking 7 on the long side of the cardboard packaging 1 where a five-digit number "84317" is applied onto the cardboard packaging 1. The numerals "8", "3" and "7" are applied using a first dye which emits a first coloured light when irradiated with UV light of wavelength  $\lambda_A$ . The numerals "4" and "1" emit a second coloured light when irradiated with UV light of the wavelength  $\lambda_B$ .

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[015] The five-digit number "84317" is thus formed from two part markings, namely from the part marking 7a "837" and the part marking 7b "41", which, as shown in Fig. 3, are interleaved. For the sake of illustration only, the partial identifications 7a and 7b are drawn in different sizes, which will be avoided in practice. In addition, the cardboard packaging 1 carries on its narrow side a picture as a third part marking 7c. The dye constituting the part mark 7c emits a third coloured light when irradiated with UV light of a wavelength  $\lambda_C$ . The three partial identifications 7a, 7b and 7c together form the identification 7 of the cardboard packaging 1.

[016] When marking the package, the applied number "84317" was recorded along with the required UV color filters for the wavelengths  $\lambda_A$ ,  $\lambda_B$  and  $\lambda_C$  for each of the three partial identifications. The UV color filter 8a for the wavelength  $\lambda_A$  was assigned a type number "8", the UV color filter 8b for the wavelength  $\lambda_B$  was a type number "10", and the UV color filter 8c for the wavelength  $\lambda_C$  assigned a type number "19". Upon irradiation of the partial marking 7c with UV light of the wavelength  $\lambda_C$ , the viewer sees the color sense impression "green", which has been assigned a type value of "6", which was also recorded.

[017] A forger, on the other hand, will initially not detect the marking 7 on the cardboard packaging at all as it is visible only in UV light. Even if he accidentally or otherwise discovers the marking 7, no information regarding the decoding wavelengths  $\lambda_A$ ,  $\lambda_B$ ,  $\lambda_C$  can be obtained from the marking 7. It is extremely unlikely that he happens to use the same dyes as the original label. Thus, by using an additional spectral selection, a counterfeited marking can be easily distinguished and identified.

[018] To mark the carton packaging containing the packed goods therein, several inkjet printing devices, which are each connected to a dye tank and computer-controlled, spray the individual digits of the marking 7 on the outside of the package 1. The computer takes over the calculation and logging of the marking 7 and the control of the inkjet printing devices. Once printed, the packages are ready to be shipped out.

[Claims omitted]

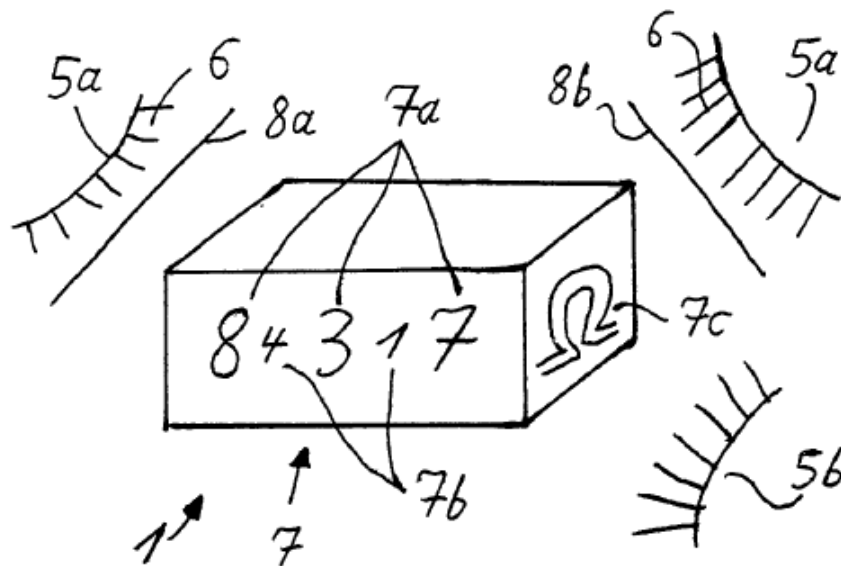


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**Fig. 3**

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**Document D2: SG 1020162222X (1/9)**

Priority date: 14 August 2016

Filing date: 14 December 2016

Publication date: 14 February 2018

**Authentication Packaging**

5    **FIELD OF THE INVENTION**

[001]    The present invention relates to an authenticating system for packaged replacement parts and to an inexpensive authentication package which will enable the end user of the packaged product to verify its authenticity upon opening the package.

10   **BACKGROUND OF THE INVENTION**

[002]    The replacement parts industry has been shown to be vulnerable to counterfeit or bogus parts introduced into the system by counterfeiters through parts brokers and distributors. Once in the system, these counterfeit parts are virtually undetectable and indistinguishable from genuine parts. Counterfeit parts have the look, feel and fit of a genuine  
15    part, but they tend to lack the qualifying specifications of the genuine part.

[003]    Counterfeit parts can comprise those made from substandard materials and to substandard tolerances which are made to look and feel exactly alike their authentic counterparts. They can also consist of refurbished authentic parts which have been cleaned  
20    and polished to look like new. In both instances, the counterfeit parts are passed off as genuine and/or new, typically through the use of replicated or reused printed packaging bearing the indicia of the manufacturer of the genuine parts. For counterfeiters, it is not difficult to obtain packaging, particularly corrugated cardboard boxes, of equal sizes as those in which the authentic parts are packaged. It is also not difficult with today's laser printing techniques and  
25    computer software to print, either on labelling or directly onto the package, indicia including the genuine manufacturer's logo to falsely suggest that the product contained in the package originated with that reputable manufacturer. It is also known that some counterfeiters obtain packaging which was originally genuine, but which had been discarded once opened and the part removed. For the end-users of these parts, it is impossible to ascertain from the part itself  
30    or from its packaging that the part is anything but authentic.



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**BRIEF DESCRIPTION OF THE DRAWINGS**

[004] FIG. 1 is a perspective view of a typical embodiment of an authentication package according to the present invention showing in hidden lines one possible positioning of the tear tape;

[005] FIG. 2 is an exploded view of a portion of multi-layered packaging material including an inscribed tear tape;

[006] FIG. 3 is a perspective view of an opened authentication package with the tear tape in the process of being removed;

[007] FIG. 4 is an overhead view of the removed tear tape doubled over on itself and showing thereon an example of the inscription code used for authenticating purposes;

[008] FIG. 5 is a plan view of a hypothetical component illustrating thereon indicia by which the coded tear tape can be compared for authentication purposes; and

[009] FIG. 6 is a flow diagram outlining the entire authentication process.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

[010] FIG. 1 illustrates generally at reference numeral 10 an authentication package in accordance with the present invention. In this case, the package 10 is in the form of a six-sided box 12 comprising a bottom 14, four upstanding side walls 16 and top 18. A tear tape 20 (shown in phantom) is provided within the walls 16 of the package. Preferably, the tear tape 20 extends substantially entirely around the perimeter of the box 12 for reasons which will also be explained below in greater detail. For illustrative purposes, the tear tape 20 is shown in FIG. 1 to extend around the side walls 16 of the package, although not shown, it will be understood that the tear tape 20 could extend around the periphery of the package in a variety of ways such as through two of the top flaps 40 (FIG. 3), two of the side walls 16 and the bottom 14. The tear tape 20 is provided with a coded inscription 22 which relates to the part or component contained in the package 10 in a predetermined manner. While both the tear tape 20 and the inscription 22 are shown (albeit in phantom) in FIG. 1, it should be realized

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that the tear tape 20 is located within the walls 16 of the box 12 and is not visible from either the outside or the inside of the package 10. Therefore, the authentication package 10 of the present invention is very inconspicuous and not distinguishable from an inspection of and comparison with a similar packaging not employing the present invention.

[011] The preferred packaging material for use with the present invention is a multi-layered paper product, particularly but not necessarily restricted to corrugated cardboard. The corrugated cardboard should have a minimum of two layers, between which layers the tear tape can be inserted during the manufacturing process. FIG. 2 shows in an exploded view an example of the relative positioning of the layers of a typical corrugated cardboard packaging material and tear tape 20. The corrugated cardboard material might comprise a corrugated layer 30 adhesively sandwiched between liner or facing layers 32, 34. A tear tape 20 having indicia 22 thereon is inserted between the facing layer 34 and the corrugated layer 30 and retained therebetween either by the adhesive normally applied between these layers or by a different and/or additional adhesive applied for that purpose.

[012] The nature of the adhered tear tape 20 is such that its adhesive strength exceeds the strength of the corrugated cardboard material whereby any attempt to remove the tape 20 results in at least the portion of the corrugated cardboard material to which the tear tape 20 is adhered to be removed therewith. FIG. 3 in this regard illustrates the removal of the tear tape 20 from the package 10. The end user, knowing of the authentication system, opens the opening flaps 40 of the package and removes the part or parts (not shown) contained therein. The end user then cuts or rips as at 42 into the package side wall 16 to expose the tear tape 20. The tear tape 20 may also be cut (due to the strength of the tear tape, it might not be possible to tear the tape 20 itself by hand) at this point to provide an end 44 thereof which can be grasped. As indicated above, if the tear tape is provided around the package though two of the top flaps 40 (FIG. 3), two of the side walls 16 and the bottom 14, then the ends of the tear tape 20 would be more readily accessible. In either case, once exposed, the tear tape 20 is then ripped from the walls 16 of the package 10 and since the tear tape 20 preferably extends substantially entirely around the package 10, its removal destroys the package and/or renders it un reusable although still recyclable. Again, the paper

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structure of the corrugated cardboard material, while quite rigid as a packaging material, is well suited to this purpose since there is not an overwhelming amount of resistance to removal of the tear.

5

[013] The removed tear tape 20 is shown in more detail in FIG. 4. The coded inscription 22 thereon comprises at least some correlating indicia which can be matched or compared with the part or parts, or matching indicia thereon, originally contained in the package 10 for authentication purposes. In general, the tear tape is made of a flat, relatively high tensile strength material. An example is a nylon tear tape which is a strip of material composed of fibrous strands of nylon.

[014] The printing technique used to inscribe the tear tape 20 depends significantly on the type of material chosen. The printing technique used should at least enable the indicia printed thereby to be readily discerned once the tear tape 20 is removed from the package.

[015] FIG. 5 shows a gasket 50 having matching indicia 52 thereon. For example, the correlating indicia might comprise a description of the part 22a, a serial number or range of serial numbers 22b which are identified on the part (52b), or might comprise a bar code 22c or other machine readable symbols which can be visually compared and matched with corresponding indicia 52c. Further identifying indicia 22d, 52d such as the part manufacturer's name or trademarks may also be provided if desired.

[016] An exemplary overall authentication process is shown schematically in the flow chart of FIG. 6. The parts manufacturer 60 has an authentication packaging requirement which can be met by the packaging system of the present invention. The parts manufacturer 60, the tear tape supplier 62 and possibly the customer or end user 64 agree at 66 on the inscription indicia to be provided on the tear tape for authenticating purposes. The tear tape supplier 62 manufactures the tear tape (67) and prints the agreed upon indicia thereon. The inscribed tear tape is either returned back to the parts manufacturer 60 (at 68) or directly to the packaging manufacturer 70 (at 68'). The parts manufacturer 60 then provides a request (at 72) to the package manufacturer 70 for a package of predetermined dimensions and material and

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provides the package manufacturer 70 with the tear tape (69), if not already provided by the  
tear tape supplier at 68'. The part is then manufactured at 74 and marked, if required, in the  
5 appropriate manner with matching indicia. The parts manufacturer 70 then manufactures the  
package material at 76 to include the supplied tear tape in the aforementioned manner and  
forms the package material into package blanks at 78 which are shipped back at 80 to the  
parts manufacturer 60. The parts manufacturer 60 then combines at 82 the package and the  
manufactured part and provides the packaged part to the end user 64 either through (84,88)  
10 distributors and/or parts brokers 86 or directly to the end user at 90. The end user 64 then  
verifies the authenticity of the part (92) by opening the package, removing the part, tearing or  
cutting the package to expose the tear tape, removing the tear tape, and comparing the  
correlating indicia on the tear tape with the part, or the matching indicia provided thereon. The  
tear tape is then destroyed at 94 and the package, being either destroyed or at least rendered  
15 un reusable through the removal of the tear tape, may then be discarded or recycled.

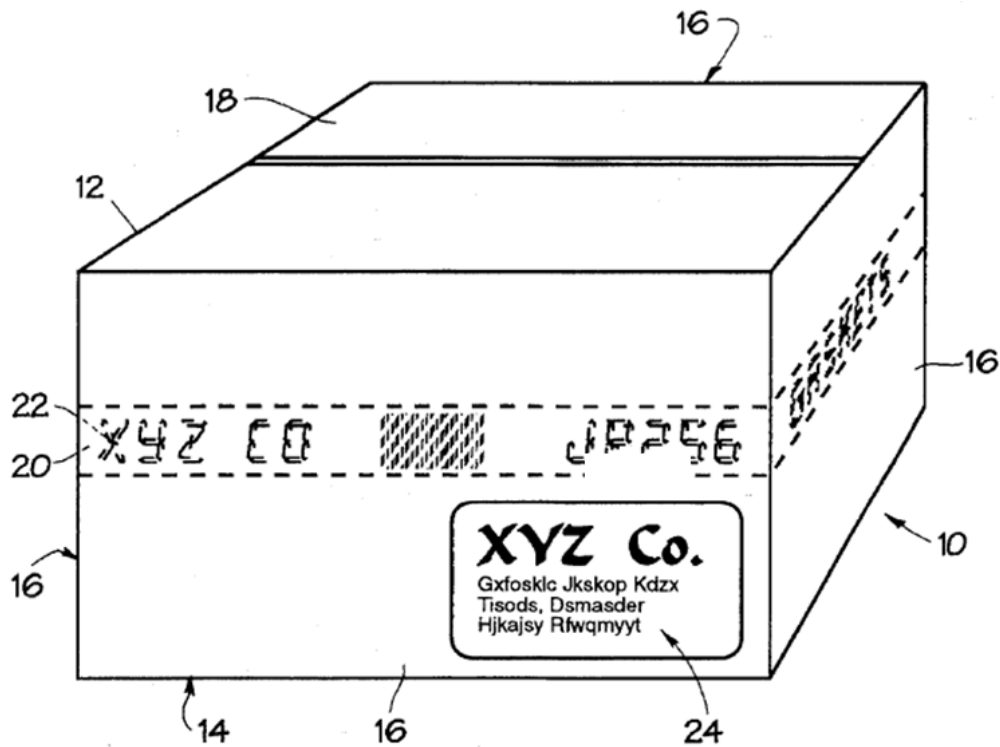
[017] In the foregoing example, the tear tape supplier 62 has been shown as a  
separate entity or third party. It is, however, quite possible that the functions described with  
respect to the tear tape supplier could be carried out "in house" by the parts manufacturer 60  
20 or the package manufacturer 70.

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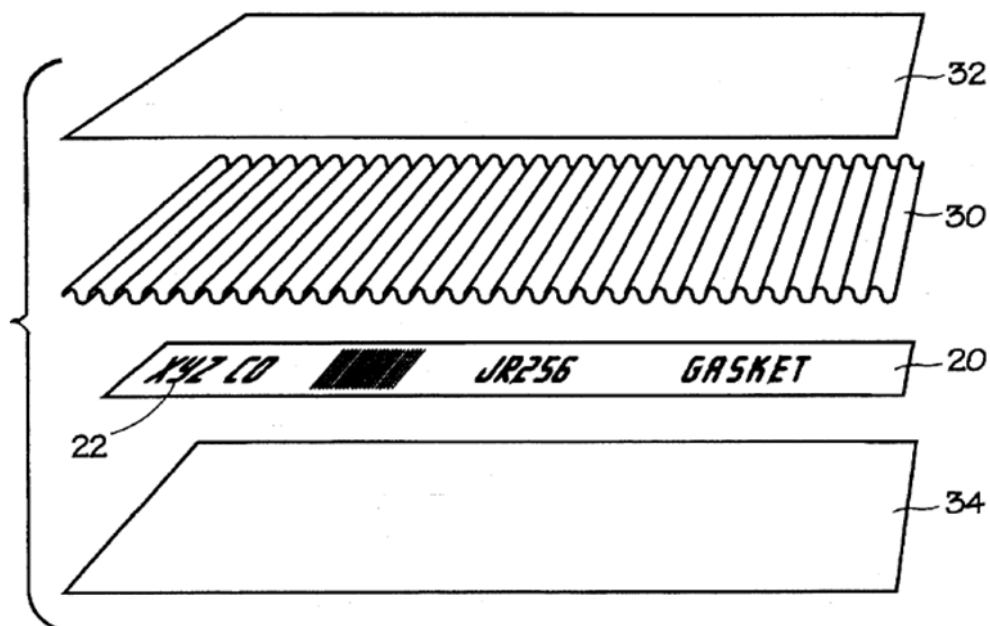
Maximum Time: 4 Hours (includes reading time)

Maximum Marks: 100

**Document D2: SG 10201622222X (6/9)**



**Fig. 1**



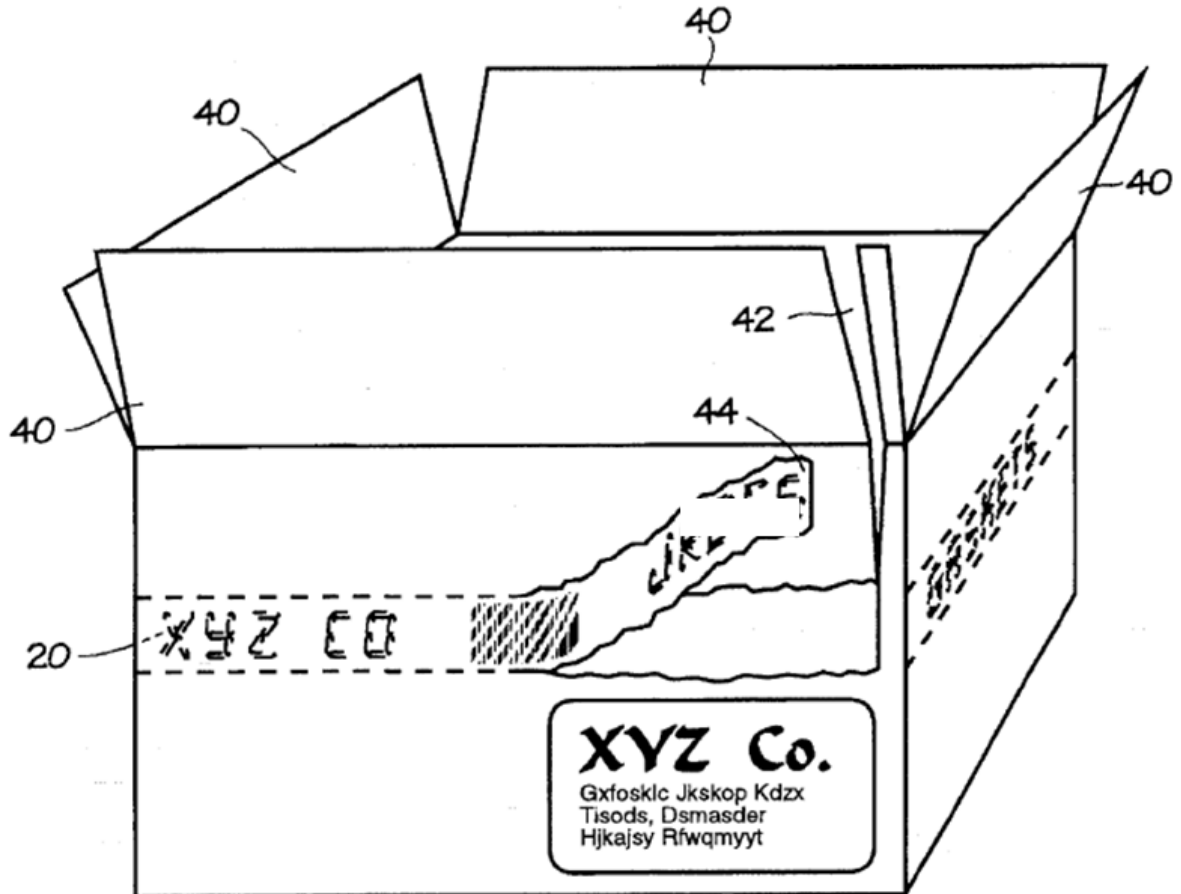
**Fig. 2**

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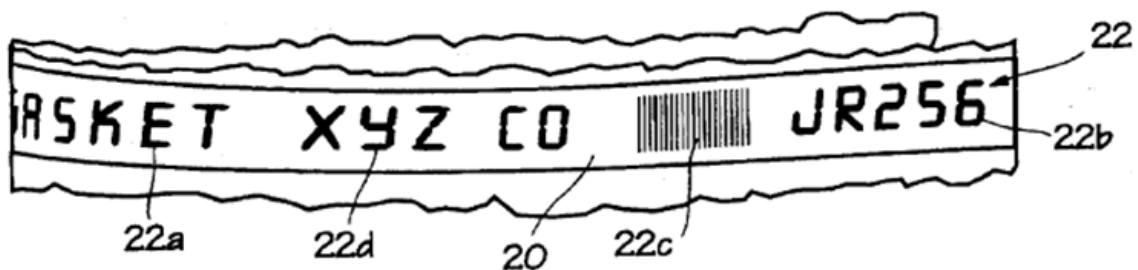
Maximum Time: 4 Hours (includes reading time)

Maximum Marks: 100

**Document D2: SG 10201622222X (7/9)**



**Fig. 3**



**Fig. 4**

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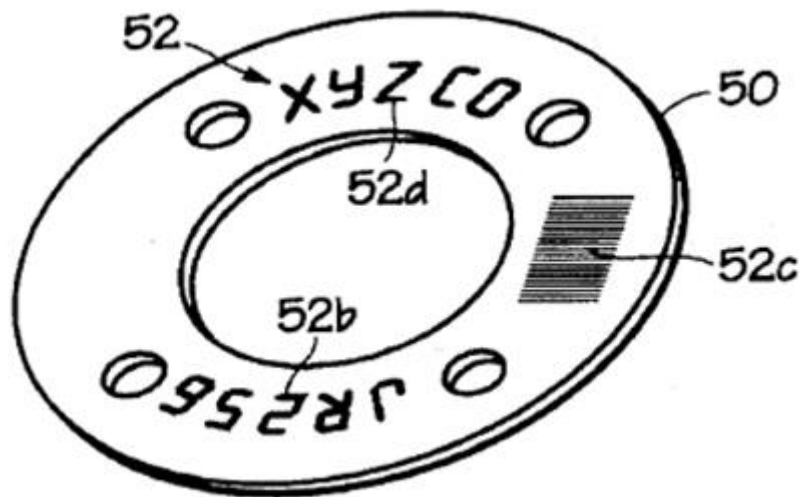


Fig. 5

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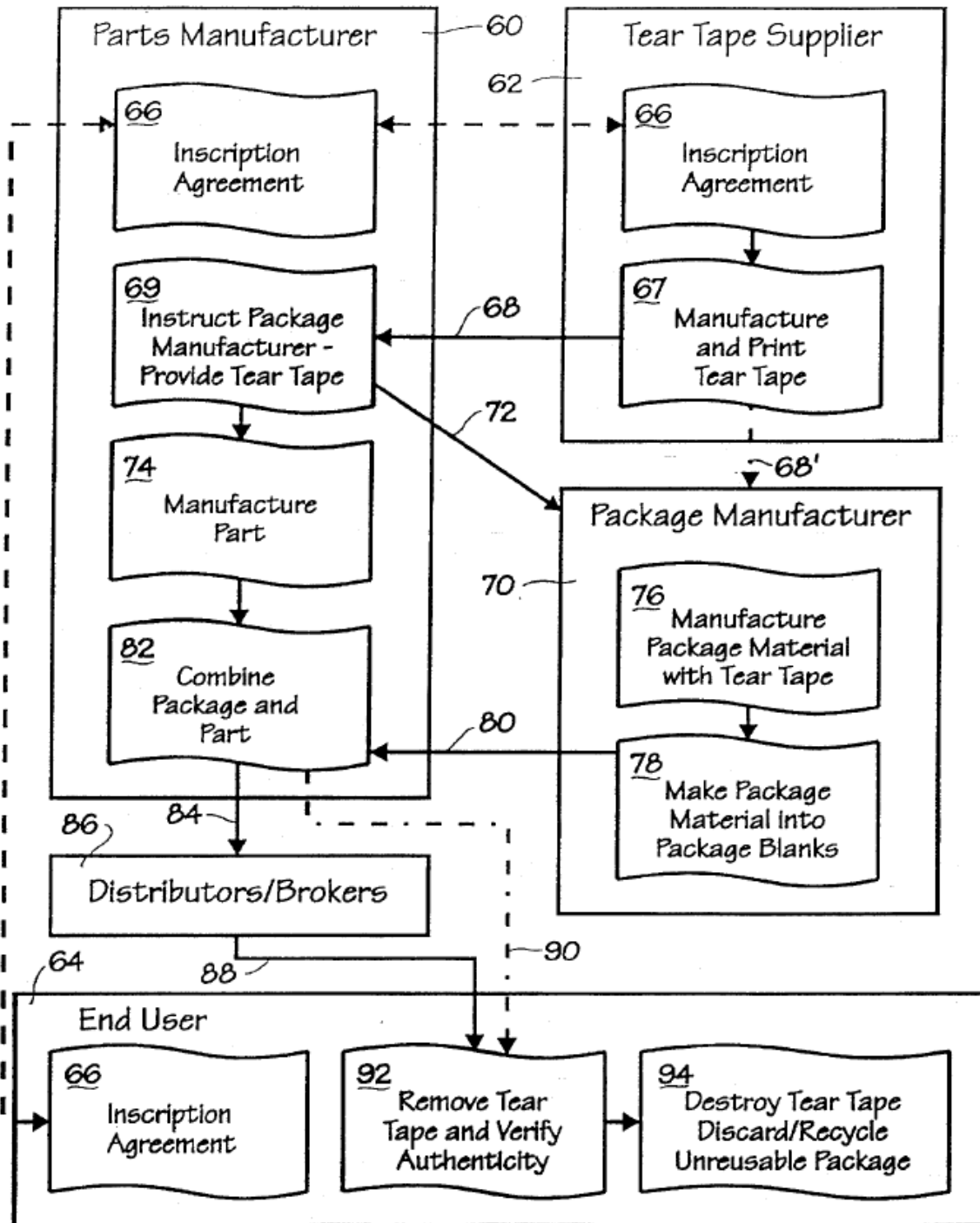


Fig. 6



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**Document D3: SG 10201112345G (1/4)**

Priority date: 29 October 2010

Filing date: 14 March 2011

Publication date: 29 April 2012

**Adhesive Tape**

5           [001]     This invention relates to tapes and is concerned with tapes for applying security devices to goods and like articles.

          [002]     The production and sale of counterfeit goods is an ever-increasing problem. Such counterfeit goods are frequently packaged so that they resemble the genuine goods as  
10   closely as possible with a view to misleading the purchaser into believing that genuine goods are being bought. This causes concern to the manufacturer of the genuine goods as the counterfeit goods are often of inferior quality to the genuine goods and thus their sale can seriously damage the reputation of the manufacturer of the genuine goods. Further, in the  
15   case where the counterfeit goods are, for example, replacement brake shoes for a motor vehicle, they may not meet the quality control standards of the manufacturer of the original goods and may thus constitute a risk to the safety of the user.

          [003]     It is therefore desirable to provide goods or the packaging for goods with a security device which will act as a guarantee that the goods are genuine goods. One known  
20   form of security device is a hologram. Conventionally, such holograms are applied by means of a hot foil stamping process. In this process, the holograms are formed on a carrier web provided with a heat activatable adhesive on its underside. Each hologram is applied to the goods or packaging by stamping it with a heated tool which cuts the hologram from the web, activates the adhesive, and presses the hologram against the surface of the goods or  
25   packaging. The process is relatively slow and therefore expensive.

          [004]     It is one object of the present invention to provide a simple technique whereby holograms may be applied to goods and other substrates.

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[005] According to one aspect there is provided a tape for applying to a substrate, to attach a security device to the substrate, which tape is formed from an oriented base film of thermoplastic plastics material and includes a security device in the form of a hologram. By providing the hologram on a tape in this way, the hologram can be readily applied to the substrate by moving the tape and substrate along converging paths and then affixing the tape to the surface of the substrate by means of an adhesive.

[006] Accordingly, another aspect provides a method of attaching a security device to the surface of a substrate which comprises: (i) providing a continuous tape as above defined, (ii) causing the substrate to move along a substrate path, (iii) moving the tape along a tape path, (iv) bringing the paths together, and (v) affixing the tape to the surface of the substrate by means of an adhesive.

[007] In an embodiment, the substrate is packaging material of, for example, plastics material film or card or fibre board or corrugated board, for enveloping goods to form a package. In this case, the tape may function as a tear tape to facilitate the opening of the package. It will generally have a free end which can be gripped by the opener and, when pulled, tears through the packaging material to enable access to be gained to the goods inside the package. Since the tear tape is present on the surface of the package, the recipient of the package can view the hologram present on the tear tape, where the hologram serves as a security device, and enable the recipient of the package to ascertain whether or not the packaging material and tear tape have been applied by an authorised person and hence whether or not the goods in the package are genuine goods. The recipient merely needs to ascertain whether or not the tear tape includes an authentic hologram as used by the original manufacturer or other authorised person. If the tear tape includes no hologram at all, then the recipient knows that the goods are not genuine goods. Similarly, if the tear tape includes a hologram which is not of the type used by the authorised person, then again he knows that the goods are not genuine.

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Maximum Marks: 100

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[008] In another embodiment, the substrate may be a shrink sleeve or a shrink collar provided on an article to prevent tampering with the article, with the tape acting as a security device to provide an indication of attempts to remove and replace the sleeve and also, optionally, acting as a tear tape for the sleeve or collar to facilitate opening. In the latter case, the tape is preferably disposed on the shrink sleeve relatively to perforations in the sleeve such that the tape splits as it tears the sleeve. In this way the tape is damaged and cannot be put to fraudulent re-use.

[009] In a further embodiment, the substrate may be a label, for example, a shrink label, denoting authenticity, with the tape acting as a security device indicating that the label has not been removed and replaced. In these cases also, by examination of the hologram the recipient of a package incorporating a tape in accordance with the invention can readily ascertain whether or not the tape is of the type applied by the manufacturer of the genuine goods or some other authorised person.

[010] In the case where the tape is applied onto the surface of filmic packaging material or other non-rigid packaging material such as fibre-board or card, it is preferred for it to be applied using a tape dispenser including a motorised reel for the tape. Alternatively, in the case where the substrate is corrugated board or other relatively non-extensible material, the tape may be applied using non-motorised tape dispensers onto the surface of the packaging material. The packaging material is one that is bought from a commercial packaging manufacturer so that brand owners need not be concerned about making the packaging material or providing their hologram template to the packaging manufacturer in case of unauthorised reproduction of the hologram in the packaging manufacturer factory. The tape is then separately applied onto the packaging material via an adhesive, made into boxes and packed with the goods.

[011] In the case where the packaging material is fluted board which can be rather rigid and have a thickness in the range 100 to 1000µm, the tape may be threaded and embedded between the fluting and the inner or outer liner of the packaging material so that the tape is not readily visible so as to provide the package with a covert security device. Alternatively, if needed, holes can be cut into the fluted board to allow the security device to

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line up with the holes and be read. Again, the fluted board packaging material can be bought and the tape separately threaded through to be embedded within the fluted board packaging material. The tape is then kept in place due to the way it is threaded and embedded within the fluted board packaging material.

[012] Where the tape is embedded within the fluted board, this will allow for the easy pulling of the tape from within the fluted board so that the tape (carrying the hologram) can be removed easily or lined up with the holes, when present, for authentication. Therefore, the tape should be slidable within the fluted board rather than being affixed in place.

[013] The base film of the tape, which may be in the form of a laminate, may for example have a thickness of from 10 to 100  $\mu\text{m}$  and a width of from 1 to 20 mm. Preferably, the thickness is from 20 to 70  $\mu\text{m}$  and the width is from 1.5 to about 15 mm.

[014] The plastics material of the base film is sufficiently dimensionally stable in the cross-direction to facilitate accurate slitting of sheets of the material to form the tape. The hologram may be applied to one surface of the base film or it may be sandwiched between two base films.

[015] A wide variety of holographic images can be incorporated to provide the desired security device. Further, the hologram may have different levels of security built into it. Thus, it may comprise an overt security device having an image visible to the naked eye and/or a covert security device having an image which is quasi visible or invisible to the naked eye. More particularly the hologram may incorporate invisible images which can only be constructed by viewing the hologram at particular angles or under special light conditions using specialist scanning equipment.

[Claims omitted]

**END**