

(19)



Europäisches Patentamt

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Office européen des brevets



(11)

EP 0 729 529 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

26.01.2000 Bulletin 2000/04

(21) Application number: **94918513.6**

(22) Date of filing: **31.05.1994**

(51) Int. Cl.⁷: **D06Q 1/00**, D21H 21/30

(86) International application number:
PCT/IT94/00073

(87) International publication number:
WO 95/33094 (07.12.1995 Gazette 1995/52)

(54) **PROCESS FOR MANUFACTURING A SAFETY YARN**

VERFAHREN ZUR HERSTELLUNG EINES SICHERHEITSFADEN

PROCEDE DE FABRICATION D'UN FIL DE SECURITE

(84) Designated Contracting States:
DE ES FR GB IT

(43) Date of publication of application:
04.09.1996 Bulletin 1996/36

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Description

[0001] The present invention concerns a process for obtaining a safety yarn that may be applied for preventing counterfeits and falsifications into the seams and decorations of documents, like passports and similar, and of leather goods and clothing, of the kind becoming luminescent if exposed to light sources like ultraviolet Wood lamps, and the realization process thereof.

[0002] It is well known that articles covered with luminescent substances, even if showing a conventional colouring when they are exposed to the optic spectrum, i.e. between 4,000 and 7,000 Angstrom wave length, when exposed to the ultraviolet rays of a Wood lamp show their luminescence with different colours and shades.

[0003] It is the aim of the present invention to exploit such feature for the realization of a new kind of yarn which, used on documents, leather goods and clothing, does not show at sight, on optic frequencies, any difference to conventional yarns but that, if exposed to the Wood lamp, becomes luminescent, with colours and shades completely different from those visible to the naked eye.

[0004] EP-A-0 169 750 is known, in which luminescence is applied exploiting a dyeing process in which fibres of a very reduced length are described, incorporated in a paper mixture.

[0005] The aim set forth is reached by means of the process, according to the present invention, for obtaining a yarn of the synthetic kind like polyamide, polyester and similar, raw or dyed and lubricated with silicone mixtures, or for obtaining a yarn of a cotton-synthetic mixture, raw or dyed and polished, satined or glazed by means of flours, grease, wax, paraffin-oil, silicon so as to eliminate all down which is always present in cotton, which is passed, according to claim 1 through a homogeneous liquid mixture of pure pigment with solvents, so as to become luminescent and remarkable in a colour shade, if exposed to the Wood lamp, different from the optical one.

[0006] The main advantage of the yarn obtained by means of the process according to the present invention, consists in that the determined shade may be perfectly seen, under the Wood lamp, without any difference of shade in the chosen colour, so as to prevent any counterfeit to the documents and the goods to which it will be applied.

[0007] The present invention will be described more in detail hereinbelow referring to the enclosed drawing in which a vertical scheme is shown of the means used for the realization process of the yarn.

[0008] The figure shows the means and the sequence of the realization phases for obtaining a safety yarn for preventing counterfeits and falsifications of documents and leather goods and clothing, characterized in:

- a plurality of means (1) for the controlled stretching of the yarn (F) coming from an initial twisting bobin

(R);

- a small basin (2) having the shape of a half cylinder, fed with constant quantities of a mixture of ink and solvent by means of a drop proportioning device (3) with adjustable flow, and containing an electrically operated first steel roll (4) under which passes said yarn (F) in its obliged way, getting completely immersed into said small basin (2);
- a second steel roll (5), kept pressed against said first roll (4) and covered with absorbent material that sucks the mixture and spreads it with extreme evenness onto said yarn (F) passing between the two rolls;
- a device (6) for keeping rolls (5) and (4) pushed one against the other, with a mechanical self-adjusting force, according to the thickness of the yarn (F), for avoiding that said yarns carries along too much mixture;
- a pottery thread-guide (7), placed before the inlet of the yarn (F) into the small basin (2) and that may be horizontally adjusted for increasing the lasting of the absorbent material of roll (5) which, due to the sliding speed of yarn (F), gets quickly worn, and for delaying the sliding between rolls (4) and (5), due to the considerable mechanic friction of said yarn (F) onto the absorbent material, which is the cause of its periodic replacement;
- a third steel roll (8), partially immersed into a basin (9) containing lubricant for providing yarn (F), with which it gets into contact, with the flowability requested for sewing, by means of a second lubrication, wherein a first lubrication performed onto said yarn (F) before its immersion into the mixture is partially reduced by the imbibition of the absorbent material on second roll (5);
- a plurality of thread-guides (10) placed before and behind roll (8);
- a Wood lamp placed between the outlet from said basin (9) and the final winding of yarn (F), for the immediate visual control of the result;
- a winding means (11) for the yarn (F).

[0009] The process will be completed by the electronic precision meter counter (12), by means of which the chosen length, according to the kind and thickness of the yarn (F) used, may be programmed, and by the control (13) of the oil level in the operating machine.

Claims

1. A process for obtaining a safety yarn, in which luminescence is applied and comprising a dyeing phase, characterized in:
 - a plurality of means (1) for the controlled stretching of the yarn (F) coming from an initial twisting bobin (R);

- a small basin (2) having the shape of a half cylinder, fed with constant quantities of a mixture of ink and solvent by means of a drop proportioning device (3) with adjustable flow, and containing an electrically operated first steel roll (4) 5
 - a second steel roll (5), kept pressed against said first roll (4) and covered with absorbent material that sucks the mixture and spreads it with extreme evenness onto said yarn (F) passing between the two rolls; 10
 - a device (6) for keeping the second and first rolls (5 and 4) pushed one against the other, with a mechanical self-adjusting force, according to the thickness of the yarn (F), for avoiding that said yarns carries along too much mixture; 15
 - a pottery thread-guide (7), placed before the inlet of the yarn (F) into the small basin (2) and that may be horizontally adjusted for increasing the lasting of the absorbent material of the second roll (5) which, due to the sliding speed of yarn (F), gets quickly worn, and for delaying the sliding between the first and second rolls (4) and (5), due to the considerable mechanic friction of said yarn (F) onto the absorbent material, which is the cause of its periodic replacement; 20
 - a third steel roll (8), partially immersed into a further basin (9) containing lubricant for providing yarn (F), with which it gets into contact, with the flowability requested for sewing, by means of a second lubrication, wherein a first lubrication performed onto said yarn (F) before its immersion into the mixture is partially reduced by the imbibition of the absorbent material on the second roll (5); 25
 - a plurality of thread-guides (10) placed before and behind the third roll(8); 30
 - a Wood lamp placed between the outlet from said basin (9) and the final winding of yarn (F), for the immediate visual control of the result; 35
 - a winding means (11) for the yarn (F). 40
2. A process according to claim 1, characterized in the presence of an electronic precision meter counter (12), for counting the chosen lengths of the yarn, according to the kind and the thickness thereof. 45

Patentansprüche

1. Vorgehen zur Erhaltung eines Sicherheitsgarnes, bei dem die Lumineszenz angewendet wird, und bestehend aus einer Färbungsphase, gekennzeichnet durch: 50
- mehrere Spanner (1) zum kontrollierten Abrol-

len des Garns (F), das von einer anfänglichen Spule (R) kommt;

- einen kleinen, halbzylinderförmigen Behälter (2), gespeist durch konstante Mengen von Mischungen aus Farbstoff und Lösungsmitteln, durch einen Tropfendosierer (3) mit regulierbarem Fluss, bestehend aus einer ersten Stahlrolle (4) mit elektrischen Antrieb, unter der das Garn (F) während seines vorbestimmten Weges durchläuft, wobei es vollständig in obigen Behälter (2) untertaucht;
- eine zweite Stahlrolle (5), die gegen die erste Stahlrolle (4) gedrückt und mit aufnahmefähigem Material verkleidet ist, dazu geeignet, die Mischung aufzunehmen und sie mit grösster Gleichmässigkeit auf das Garn (F) zu verteilen, das zwischen den zwei Rollen durchläuft;
- eine Vorrichtung (6) um die zweite und erste Rolle (5 und 4) mittels einer sich selbst regulierenden mechanischen Kraft gegeneinander gedrückt zu halten, und zwar mit Hinsicht auf die Dicke des Garnes (F), um zu verhindern, dass dieses Überflüssige Mischung transportiert;
- eine Lenkvorrichtung des Garnes aus Keramik (7), die vor dem Eintritt des Garnes (F) in den Behälter (2) vorgesehen ist, und die auf horizontaler Ebene regulierbar ist, um die Dauerhaftigkeit des absorbierenden Materials der zweiten Rolle (5) zu erhöhen, die sich auf Grund der Laufgeschwindigkeit des Garnes (F) schnell verbraucht, und um das Rutschen zwischen der ersten und zweiten Rolle (4 und 5) zu verzögern, das durch hohe mechanische Reibung des Garnes (F) selbst auf das saugfähige Material hervorgerufen wird, das den Grund für das periodische Auswechseln bildet;
- eine dritte Stahlrolle (8), die teilweise in einen weiteren Behälter (9) getaucht ist, der Schmiermittel enthält, um das Garn (F), mit dem es in Berührung kommt, mit der nötigen Gleitbarkeit für den Nähgebrauch mittels einer zweiten Schmierung zu versehen, da die erste Schmierung, die schon auf dem Garn (F) vor dem Eintauchen in die Mischung durchgeführt wurde, teilweise durch Vollsaugen des absorbierenden Materials auf der zweiten Rolle (5) verringert wird;
- eine Lenkvorrichtung (10) des Garnes, die vor und nach der dritten Rolle (8) angebracht ist;
- eine Woodlampe, die zwischen dem Austritt

besagten Behälters (9) und der Endspule des Garnes (F) vorgesehen ist, um eine augenblickliche visive Kontrolle des Ergebnisses zu ermöglichen;

- ein Spulungsmittel (11) für das Garn (F).

2. Vorrichtung nach Anspruch 1, gekennzeichnet durch die Gegenwart eines elektronischen Präzisionsmeterzählers (12), um die gewählte Länge des Garnes anzuzeigen, und zwar auf Grund seiner Art und Dicke.

Revendications

1. Procédé pour l'obtention d'un filé de sécurité dans lequel on applique la luminescence et qui comprend une phase de teinture, caractérisé par:

- plusieurs tenseurs (1) pour le déroulement contrôlé du filé (F) qui vient d'un rochet initial (R);
- un bassinnet (2) à conformation hémicylindrique, alimenté par des quantités constantes de mélange d'encre et de dissolvant, au moyen d'un doseur à goutte (3) avec flux réglable, et qui contient un premier rouleau d'acier (4) avec actionnement électrique, sous lequel passe le filé (F) dans son parcours obligé, se noyant complètement dans le bassinnet (2) même;
- un deuxième rouleau d'acier (5), tenue pressé contre dit premier rouleau (4), revêtu de matériel absorbant, apte à incamérer le mélange et à le distribuer avec une uniformité extrême sur le filé (F) qui passe entre les deux rouleaux;
- un dispositif (6) pour maintenir le deuxième et le premier rouleau (5 et 4) pressé l'un contre l'autre, avec une force mécanique autoréglante, en fonction de l'épaisseur du filé (F), pour éviter que celui-ci transporte mélange en excès;
- un guide-fil en céramique (7), disposé avant l'entrée du filé (F) dans le bassinnet (2) réglable horizontalement pour augmenter la durée du matériel absorbant du deuxième rouleau (5) qui, à cause de la rapidité du déroulement du filé (F), s'usure rapidement, et pour retarder le glissement entre le premier et le deuxième rouleau (4 et 5) dû au frottement mécanique considérable du filé (F) même sur le matériel absorbant, cause de sa substitution périodique;
- un troisième rouleau (8), partiellement plongé

dans un bassinnet (9) ultérieur, contenant lubrifiant, pour fournir le filé (F) avec lequel il vient en contact, du glissement nécessaire aux emplois de couture au moyen d'une deuxième lubrification, déjà effectuée sur le filé (F) avant le plongement dans le mélange, et qui vient partiellement réduit par l'imbibition du matériel absorbant sur le deuxième rouleau (5);

- plusieurs guides-fil (10) disposées entre le sortie de dit bassinnet (9) et la bobine finale du filé (F) pour le contrôle visuel immédiat du résultat;
- un moyen de bobinage (11) pour le filé (F).

2. Procédé selon la revendication 1, caractérisé par la présence d'un compte-mètres électronique de précision (12) pour le relèvement de la longueur prédéterminée du filé en raison du type et de l'épaisseur.

