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(54) 【発明の名称】 積層板原紙及び積層板

(57) 【要約】

【課題】 寸法安定性、耐熱性、電気特性に優れた積層板を製造するのに適した積層板原紙を提供する。

【解決手段】 セルロース繊維を含有する積層板原紙において、セルロース繊維がタケパルプを含むことを特徴とする積層板原紙。セルロース繊維がタケパルプ1●～8●重量%及び木材パルプ2●～9●重量%を含有することを特徴とする上記の積層板原紙を開示する。

【特許請求の範囲】

【請求項1】 セルロース繊維を含有する積層板原紙において、セルロース繊維がタケパルプを含むことを特徴とする積層板原紙。

【請求項2】 セルロース繊維がタケパルプ10～80重量%及び木材パルプ20～90重量%を含有することを特徴とする請求項1記載の積層板原紙。

【請求項3】 タケパルプの繊維長0.2mm以下の微細繊維の含有率が5重量%以下であることを特徴とする請求項1または2記載の積層板原紙。

【請求項4】 請求項1、2または3記載の積層板原紙に熱硬化性樹脂を含浸したプリプレグを積層し、成型してなる積層板。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は積層板原紙及びそれを使用した積層板に関し、特に寸法安定性、電気特性、耐熱性の良好な積層板を作製するのに適した積層板原紙及び積層板に関する。

【0002】

【従来の技術】通常の積層板、特にプリント配線板用の積層板は、積層板原紙にフェノール樹脂、エポキシ樹脂等の熱硬化性樹脂を含浸し、これを加熱乾燥して半硬化樹脂の状態（これをプリプレグという）にし、このプリプレグを複数枚積層し、熱圧成型することにより製造される。このようなプリント配線板は、比較的安価で、通常の電気あるいは電子機器に使用するための性能をほぼ満足しているため、家庭電気製品を中心に多く使用されている。しかしながら、近年電気製品は、軽薄短小化してきているため、IC、コンデンサー、抵抗等の電気製品部品の装着密度が高くなり、プリント配線の導体パターンの細線化が進んでいる。さらには、家電メーカーの産業機器への参入や低価格指向の高まりから、従来、紙基材では不可能とされていた分野への紙基材の使用が広がりつつある。このため、紙を基材とする積層板にも寸法安定性はもちろんのこと、電気特性、耐熱性等の改良要求が厳しくなってきている。

【0003】従来から、積層板原紙は、広葉樹材からの晒クラフトパルプ（LBKP）を未叩解で使用して抄紙し、0.45～0.55 g/cm³ 程度の低密度の紙とするのが一般的であるが、特に電気特性、耐熱性が要求される場合、溶解用パルプやコットンリント等のαセルロース含有率の高いパルプが使用されている。しかし、これらのパルプ繊維は屈曲やねじれが著しく、LBKPによる原紙に比べ、積層板の寸法安定性が大きく劣るといった問題がある。これを解決するために、LBKPの製造工程において、特定の蒸解、漂白条件や酵素処理により、パルプのヘミセルロース分を低減する方法（特開平6-146193、特開平6-287898等）が提案されていた。しかしながら、これらの手法を

用いれば、LBKPの寸法安定性を維持しながら耐熱性、電気特性を改良できるものの、コットンリントや溶解用パルプほどの優れた耐熱性、電気特性は得られない。他方、通常のLBKPとリント等のαセルロース含有率の高いパルプを混合することも検討されたが、むしろ両者の短所の影響が大きく、期待するような効果は得られなかった。

【0004】

【発明が解決しようとする課題】本発明は上記の問題を解決し、寸法安定性、耐熱性、電気特性が良好な積層板及び積層板を製造するのに適した積層板原紙を提供することを目的とする。本発明者は、かかる現状に鑑み、積層板の耐熱性、電気特性を向上させるために、種々のパルプ繊維を検討した結果、タケパルプを抄紙原料とする積層板原紙による積層板は、寸法安定性、耐熱性、電気特性のバランスが極めて優れることを見だし、本発明を完成するに至った。

【0005】

【課題を解決するための手段】本発明は下記の態様を含む。

〔1〕 セルロース繊維を含有する積層板原紙において、セルロース繊維がタケパルプを含むことを特徴とする積層板原紙。

〔2〕 セルロース繊維がタケパルプ10～80重量%及び木材パルプ20～90重量%を含有することを特徴とする〔1〕記載の積層板原紙。

〔3〕 タケパルプの繊維長0.2mm以下の微細繊維の含有率が5重量%以下であることを特徴とする〔1〕または〔2〕記載の積層板原紙。

〔4〕 〔1〕、〔2〕または〔3〕記載の積層板原紙に熱硬化性樹脂を含浸したプリプレグを積層し、成型してなる積層板。

【0006】

【発明の実施の形態】タケパルプは木材パルプと比較して、繊維が剛直であり、吸油性が高いため、主に書道半紙、画仙紙、画材紙、スピーカーコーン紙及びファンシーペーパー等を使用されているが、積層板原紙には全く使用されていないものである。しかしながら、本発明者らはタケパルプを使用した積層板原紙が非常に優れていることを見出した。本発明に使用されるタケパルプには、孟宗竹や真竹のように根茎から育成される竹や、株から育成されるバンブーから得られる化学パルプがあり、繊維強度、蒸解性、晒性、夾雑物の混入等を考慮するならば、アルカリ蒸解、クラフト蒸解、あるいはサルファイト蒸解したバンブーからのタケパルプが好適である。本発明の積層板原紙におけるタケパルプの含有率は、特に限定するものではなく、組み合わせる材料、要求される品質に応じて適宜調整される。本発明の積層板原紙はセルロース繊維を主成分とするが、タケパルプ以外のセルロース繊維を併用することができる。このよう

なセルロース繊維は、特に限定するものでなく、木材チップから得られる化学パルプ、機械パルプ、リントー、麻、ケナフ等の非木材パルプ、溶解用パルプ等が使用でき、特に広葉樹材を用いた晒クラフトパルプが好ましい。さらに、セルロース繊維以外の材料として、合成繊維、無機繊維、填料、各種助剤等を目的とする品質に応じて適宜配合することももちろん可能である。

【0007】またタケパルプに広葉樹からの木材パルプを併用すると地合に優れた原紙が得られるため好ましいが、タケパルプの含有率が少ないと本発明の効果が十分に得られない恐れもある。より好ましくはセルロース繊維がタケパルプ10～80重量%及び木材パルプ20～90重量%を含有する。この場合、更に別のパルプも含有し得る。

【0008】また、タケパルプは繊維長0.2mm以下の微細繊維の含有量が10～20重量%程度と木材パルプ等に比較して多いが、好ましくは微細繊維の含有率を5重量%以下、さらに好ましくは微細繊維の含有率を1重量%以下となるよう、微細繊維の除去処理を行うことにより、寸法安定性、耐熱性、電気特性のいずれもが向上する。微細繊維の除去方法は特に限定されないが、例えばスクリーン処理による方法、ワイヤーを介して遠心脱水することによる除去方法等が挙げられる。

【0009】

【実施例】以下に実施例を挙げて本発明をより具体的に説明するが、本発明はもちろんこれらに限定されるものではない。なお、実施例および比較例中の%は、すべて重量%を示す。本発明に用いたタケパルプ、タケパルプの微細繊維の除去方法、タケパルプの微細繊維含有率の測定法、樹脂含浸性評価法、積層板の製造法、および積層板の寸法安定性評価法は次の通りである。

タケパルプ

本発明の実施例および比較例に使用したタケパルプは、タイ産のバンブーからのパルプ（タイ：フェニックス社蒸解品）でパルプ化の条件は次の通りである。カミヤ連続蒸解釜にてクラフト蒸解を行い、漂白シーケンスC-E-H-Dにて漂白後、抄上げ処理を行いドライパルプシートを得た。得られたタケパルプの繊維長0.2mm以下の微細繊維含有率は14%であった。このタケパルプをタケパルプA、後述の微細繊維除去方法にて得られた、繊維長0.2mm以下の微細繊維含有率が0.5重量%のタケパルプをタケパルプB、タケパルプAとタケパルプBを7:20の比率で混合し、繊維長0.2mm以下の微細繊維含有率を4重量%となるよう調成したタケパルプをタケパルプCとする。

【0010】タケパルプの微細繊維の除去方法

タケパルプの微細繊維の除去方法は、絶乾パルプ重量10gを繊維長ふるい分け機（商品名：パウアー篩分け機／東西精器（株）製）を使用して、注水量が8.31/分の条件にて15分間注水攪拌し、150メッシュを通

過する繊維を取り除いた。

タケパルプの微細繊維含有率の測定法

タケパルプの微細繊維含有率の測定は、繊維投影図の画像解析により行った。繊維長分布測定器（商品名：FS-200、KAJAANI社製）を用いて各繊維の繊維長、繊維幅を測定し、これらの値から各繊維に重さづけを行うことにより、繊維長0.2mm以下の微細繊維含有率（重量%）を求めた。

【0011】地合の評価法

地合の評価は、目視観察して良いものを（●）、やや悪いが実用上問題ないものを（▲）、悪く実用できないものを（×）の3段階で評価した。

【0012】積層板の製造法

積層板の製造法は、積層板原紙に市販の水溶性フェノール樹脂（商品名：ショウノールBL-2854/昭和高分子（株）製）を含浸し、100℃の温度で5分間乾燥することにより、樹脂と基材の比率が15:85の一次プリプレグを作製し、次にこの一次プリプレグに市販の油変性フェノール樹脂（商品名：ショウノールBLS-3122/昭和高分子（株）製）を含浸し、100℃の温度で5分間乾燥することにより、水溶性フェノール樹脂と油変性フェノール樹脂の両方を合わせた樹脂と基材の比率が50:50のプリプレグを作製した。次にプリプレグを8枚積層し、165℃の温度で100kg/cm²、60分間加圧成型することによって、フェノール樹脂積層板を得た。

積層板の寸法安定性評価法

積層板の寸法安定性評価法は、次の方法により寸法変化率を測定することにより行った。積層板にスパン200mmで標点を付け、加熱冷却前後の標点間の寸法を高精度2次元座標測定装置（商品名：デジタルリーダーDR-550-D/大日本スクリーン製造（株）製）で測定した。寸法変化率αは下記の式より求める。手抄きシートを用いる場合、シートの異方性はないため、4点の平均値をもって示す。根本的に寸法変化率が0%に近いほど寸法安定性が良好と判断される。

$$\alpha(\%) = [(L_0 - L_1) / L_0] \times 100$$

L₀ : 加熱冷却前の標点間の長さ。

L₁ : 160℃、1時間加熱処理後の標点間の長さ。

【0013】積層板の耐熱性評価法

積層板の耐熱性は、以下の方法で半田耐熱性を測定することにより行った。試験片（25mm×25mm）を溶融半田浴（260℃±1℃）に浸漬し、破裂音がするまでの時間を測定し、この時間（秒）をもって耐熱性の指標とした。数値が大きいほど耐熱性が良好と判断される。

積層板の電気特性評価法

積層板の電気特性は、JIS-C6481に準じ、基板の絶縁抵抗を測定することにより評価した。測定は常態および煮沸後（100℃、2時間）で行った。絶縁抵抗

が高いほど電気特性が良好と判断される。

【0014】実施例1

タケバルブAからなるバルブスラリーに、メラミン樹脂（商品名：スミレッツレジンAC8／住友化学（株）製）を対バルブ1％添加し、実験室角型手抄きマシンにおいて手抄きして、坪量126g/m²、密度0.5g/cm³の積層板原紙を得た。この積層板原紙を用いて積層板を作製した。

実施例2

タケバルブAの代わりにタケバルブCを用いた以外は、実施例1と同様にして積層板原紙および積層板を得た。

【0015】実施例3

タケバルブAの代わりにタケバルブBを用いた以外は、実施例1と同様にして積層板原紙および積層板を得た。

【0016】実施例4

バルブ配合をタケバルブA 15％、南アフリカ産アカシア材からの未叩解晒クラフトバルブ（以下単にL B K Pとも記す）85％とした以外は実施例1と同様にして積層板原紙および積層板を得た。

実施例5

バルブ配合をタケバルブA 75％、南アフリカ産アカシア材からの未叩解晒クラフトバルブ25％とした以外は実施例1と同様にして積層板原紙および積層板を得た。実施例6

バルブ配合をタケバルブA 85％、南アフリカ産アカシア材からの未叩解晒クラフトバルブ15％とした以外は実施例1と同様にして積層板原紙および積層板を得た。

【0017】比較例1

タケバルブAの代わりに、南アフリカ産アカシア材からの未叩解晒クラフトバルブ（L B K P）を（100％）用いた以外は、実施例1と同様にして積層板原紙および積層板を得た。

比較例2

タケバルブAの代わりにコットンリンターバルブを（100％）用いた以外は、実施例1と同様にして積層板原

紙および積層板を得た。実施例および比較例で得られた積層板の評価結果を表1に示す。タケバルブAの微細繊維含有率は14％、タケバルブBの微細繊維含有率は0.5％、タケバルブCの微細繊維含有率は4％、L B K Pの微細繊維含有率は2.5％であった。表1から明らかなように、L B K Pをリンターバルブに置換すると耐熱性、電気特性は向上するが、寸法安定性が悪化する（比較例1と比較例2の比較）のに対し、タケバルブに置換すると寸法安定性は同程度で耐熱性、電気特性が向上する（比較例1と実施例1の比較）。また、タケバルブの微細繊維を除去することにより、寸法安定性、耐熱性、電気特性のいずれもが向上する（実施例1と実施例2、3の比較）。更にタケバルブとL B K Pを併用すると地合の良い積層板原紙が得られた。

【0018】

【表1】

		寸法 変化率	絶縁抵抗 常態 ×10 ¹¹ Ω	絶縁抵抗 煮沸後 ×10 ¹⁰ Ω	耐熱性 秒
実施例1	△	0.122	6.1	4.8	24
実施例2	△	0.115	6.3	5.1	29
実施例3	△	0.112	6.4	5.3	31
実施例4	○	0.124	5.4	1.4	19
実施例5	○	0.122	5.9	3.6	22
実施例6	△	0.123	5.9	4.2	24
比較例1	○	0.123	5.0	0.8	17
比較例2	△	0.257	5.0	5.1	30

【0019】

【発明の効果】前記した如く、本発明は、積層板の寸法安定性、耐熱性、電気特性が良好な積層板を製造するのに最も適した積層板原紙を提供するという効果を奏する。従って、その工業的意義は極めて大きい。

Base paper for laminated plate, and laminated plate

Abstract

PROBLEM TO BE SOLVED: To obtain a laminated plate which is excellent in dimensional stability, resistance to heat, and electric properties, by forming prepregs by using a base paper for lamination made of a specific bamboo pulp-containing cellulose fibers, laminating and thermo-compressing the prepregs. **SOLUTION:** A mixed pulp slurry containing 10-80wt.% of bamboo slurry from which microfibrils of <0.2mm length are removed less than 5wt.% content and 20-90wt.% of wood pulp is subjected to sheet making to prepare base paper for lamination. The lamination base paper is impregnated with a thermosetting resin, for example, a phenolic resin or epoxy resin, heated and dried thereby producing prepregs. These prepregs are laminated and thermocompressed to give the objective laminated plate.

Classifications

☞ H05K1/0366 Organic insulating material consisting of two or more materials, e.g. two or more polymers, polymer + filler, + reinforcement reinforced, e.g. by fibres, fabrics

JPH10102392A

Japan

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Other languages: Japanese

Inventor: Susumu Watanabe, 渡辺 晋三, Tomoyuki Terao, 寺尾 隆之 郎, Jun Osawa, 尾 大蔵

Current Assignee: New Oji Paper Co Ltd

Worldwide applications

1996 JP

Application JP25452696A events ⓘ

1996-09-26 Application filed by Oji Paper Co Ltd

1996-09-26 Priority to JP25452696A

1998-04-21 Publication of JPH10102392A

Status Pending

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Claims (4)

Hide Dependent ⓘ
translated from Japanese

[Claims] 1. A base paper for a laminate comprising cellulose fibers, wherein the cellulose fibers comprise bamboo pulp. 2. The bamboo pulp having a cellulose fiber content of 10 to 80.

The base paper for laminated board according to claim 1, wherein the base paper contains 20% to 90% by weight of wood pulp. 3. The laminated base paper according to claim 1, wherein the content of the fine fibers having a fiber length of 0.2 mm or less in the bamboo pulp is 5% by weight or less. 4. A laminate obtained by laminating a prepreg impregnated with a thermosetting resin on the laminate base paper according to claim 1, 2 or 3, and molding the laminate.

Description

translated from Japanese

DETAILED DESCRIPTION OF THE INVENTION

[0001]

BACKGROUND OF THE INVENTION 1. Field of the Invention The present invention relates to a base paper for laminated board and a laminated board using the same, and more particularly, to dimensional stability, electrical characteristics, and the like.

The present invention relates to a laminate base paper and a laminate suitable for producing a laminate having good heat resistance.

[0002]

2. Description of the Related Art A conventional laminate, especially a laminate for a printed wiring board, is prepared by impregnating a laminate base paper with a thermosetting resin such as a phenolic resin or an epoxy resin and heating and drying the same to form a semi-cured resin. (This is referred to as a prepreg), a plurality of the prepregs are laminated, and hot-press molding is performed. Such a printed wiring board is relatively inexpensive and almost satisfies the performance for use in ordinary electric or electronic devices, and thus is widely used mainly for home electric appliances. However, in recent years, since electric products have become lighter, thinner and smaller, the mounting density of electric product parts such as ICs, capacitors, and resistors has increased, and the conductor patterns of printed wiring have become finer. Furthermore, with the entry of home appliances manufacturers into industrial equipment and the trend toward lower prices, the use of paper base materials in fields that were previously impossible with paper base materials is expanding. For this reason, demands for not only dimensional stability but also improvements in electrical characteristics, heat resistance, and the like, of a laminate made of paper as a base material, have become strict.

Conventionally, laminates base paper, bleached kraft pulp from hardwood and (LBKP) be used in non-beaten paper, to paper of low density of the order 0.45~0.55g / cm³. In general, when electrical characteristics and heat resistance are required, pulp for dissolution or pulp having a high α-cellulose content such as cotton linter is used.

However, these pulp fibers are remarkably bent and twisted, and LB

There is a problem that the dimensional stability of the laminated board is significantly inferior to the base paper by KP. To solve this, LBK

In the production process of P a method of reducing the hemicellulose content of pulp by specific digestion, bleaching conditions or enzymatic treatment (JP-A-6-146193, JP-A-6-287898)

Etc.) had been proposed. However, if these techniques are used, the heat resistance and the electrical properties can be improved while maintaining the dimensional stability of the LBKP, but the heat resistance and electrical properties as excellent as cotton linter and dissolving pulp cannot be obtained. On the other hand, mixing of ordinary LBKP and pulp having a high α-cellulose content such as linter was also studied, but the disadvantages of both were rather large, and the expected effects could not be obtained.

[0004]

SUMMARY OF THE INVENTION The present invention solves the above-mentioned problems and provides a laminate having good dimensional stability, heat resistance and electrical properties, and a laminate base paper suitable for producing the laminate. With the goal, in view of this situation, the present inventors have studied various pulp fibers in order to improve the heat resistance and electrical properties of the laminate. As a result, the laminate made of bamboo pulp using bamboo pulp as a raw material has a dimensional stability. It was found that the balance between heat resistance and electrical properties was extremely excellent, and the present invention was completed.

[0005]

The present invention includes the following aspects: [1] A base paper for a laminate comprising cellulose fibers, wherein the cellulose fibers comprise bamboo pulp. [2] Cellulose fiber is bamboo pulp 10 to 80% by weight. And the laminated stencil paper according to [1], which contains 20 to 90% by weight of wood pulp. [3] The content of fine fibers having a fiber length of 0.2 mm or less in bamboo pulp is 5% by weight or less [1]. Or the laminated board base paper according to [2]. [4] A laminate obtained by laminating a prepreg impregnated with a thermosetting resin on the laminate base paper according to [1], [2] or [3] and molding the laminate.

[0006]

DESCRIPTION OF THE PREFERRED EMBODIMENTS Bamboo pulp is mainly used for calligraphy paper, art paper, art material paper, speaker cone paper, fancy paper, etc., because bamboo pulp has more rigid fibers and higher oil absorbency than wood pulp. However, it is not used at all in the laminated base paper. However, the present inventors have found that laminated base paper using bamboo pulp is very excellent. The bamboo pulp used in the present invention includes bamboo grown from rhizomes, such as Moso bamboo and bamboo, and chemical pulp obtained from bamboo grown from a strain, and has fiber strength, digestibility, bleaching property, and impurities. If mixing is considered, bamboo pulp from bamboo cooked by alkali cooking, kraft cooking or sulfite cooking is preferred. The bamboo pulp content in the laminated base paper of the present invention is not particularly limited, and is appropriately adjusted according to the material to be combined and the required quality. Although the base paper for a laminate of the present invention mainly contains cellulose fibers, cellulose fibers other than bamboo pulp can be used in combination. Such cellulose fibers are not particularly limited, and chemical pulp obtained from wood chips, mechanical pulp, linter, Non-wood pulp such as hemp and kenaf, pulp for dissolution and the like can be used, and bleached kraft pulp using hardwood is particularly preferable. Furthermore, as a material other than the cellulose fiber, synthetic fibers, inorganic fibers, fillers, various auxiliaries, and the like can be appropriately blended according to the desired quality.

[0007] It is preferable to use bamboo pulp in combination with wood pulp from broad-leaved trees, since a base paper excellent in formation can be obtained. However, if the bamboo pulp content is low, the effects of the present invention may not be sufficiently obtained. More preferably, the cellulose fiber is 10 to 80% by weight of bamboo pulp and 20 to 90% by weight. In this case, further pulp may be contained.

Further, bamboo pulp has a content of fine fibers having a fiber length of 0.2 mm or less of about 10 to 20% by weight as compared with wood pulp or the like, but preferably has a fine fiber content of 5% by weight or less. More preferably, the content of fine fibers is 1

By performing the fine fiber removal treatment so as to be not more than the weight%, all of the dimensional stability, heat resistance, and electric characteristics are improved. The method for removing the fine fibers is not particularly limited, and examples thereof include a method by a screen treatment and a method by centrifugal dehydration through a wire.

[0009]

EXAMPLES The present invention will be described in more detail with reference to the following Examples, but it should be understood that the present invention is by no means restricted thereto. The percentages in Examples and Comparative Examples all indicate weight%. The bamboo pulp used in the present invention, the method for removing fine fibers of bamboo pulp, the method for measuring the fine fiber content of bamboo pulp, the method for evaluating resin impregnation, the method for manufacturing a laminate, and the method for evaluating the dimensional stability of a laminate are as follows. It is Bamboo pulp. Bamboo pulp used in Examples and Comparative Examples of the present invention is:

The conditions of pulping with Thai bamboo pulp (Thailand: Phoenix cooked product) are as follows. Kraft cooking is performed in the Kamiya continuous digester and the bleaching sequence C:-

After bleaching with EHO, a paper milling treatment was performed to obtain a dry pulp sheet. Fiber length of obtained bamboo pulp 0.2 mm

The following fine fiber content was 1.4%. This bamboo pulp was bamboo pulp A, and bamboo pulp obtained by the fine fiber removal method described below and having a fiber length of 0.2 mm or less and a fine fiber content of 0.5% by weight was bamboo pulp B, and bamboo pulp A and bamboo pulp B were 7:20. Mixed at a ratio of 0.2mm fiber length

The bamboo pulp prepared to have the following fine fiber content of 4% by weight is referred to as bamboo pulp C.

A method for removing fine fibers from bamboo pulp A method for removing fine fibers from bamboo pulp is described below

Using a fiber length sieving machine (trade name: Bauer sieving machine / manufactured by Tuzai Seiki Co., Ltd.), the water injection amount was 6.3 l / g

The mixture was stirred under water for 15 minutes to remove fibers passing through 150 mesh. Measurement method of fine fiber content of bamboo pulp The measurement of fine fiber content of bamboo pulp was performed by image analysis of a fiber projection diagram. Fiber length distribution: measuring instrument (trade name: FS

-230, manufactured by KAIKANI Co., Ltd.), the fiber length and the fiber width of each fiber are measured, and each fiber is weighed from these values, whereby the content (weight) of the fine fiber having a fiber length of 0.2 mm or less is obtained. %).

Evaluation method of formation The evaluation of formation was evaluated in three stages: (○) for those which were good by visual observation, (△) for those which were somewhat bad but had no practical problems, and (×) for those which were not practical for practical use. evaluated.

A method for producing a laminate is performed by impregnating a laminate base paper with a commercially available water-soluble phenol resin (trade name: Shaonol BRL-2054 / manufactured by Showa Polymer Co., Ltd.). By drying at a temperature for 5 minutes, a primary prepreg having a resin to base material ratio of 1:85 was prepared, and a commercially available oil-modified phenol resin (trade name: Shaonol BLS) was added to the primary prepreg.

-3122 / Showa Polymer Co., Ltd.) at 100 ° C.

At a temperature of 5 minutes to prepare a prepreg having a ratio of resin and base material of both water-soluble phenol resin and oil-modified phenol resin of 50:50.

Next, eight prepregs were laminated, and 100 kg /

A phenolic resin laminate was obtained by pressure molding at 60 cm² for 60 minutes. **Evaluation method of dimensional stability of laminate** The evaluation method of dimensional stability of the laminate was performed by measuring a dimensional change rate by the following method. Span 200 on laminate mm, and measure the dimension between the gauges before and after heating / cooling with a high-precision two-dimensional coordinate measuring device (trade name: Digital Reader DR)

-550-D / Dainippon Screen Manufacturing Co., Ltd.). The dimensional change rate is obtained from the following equation. When a hand-made sheet is used, there is no anisotropy in the sheet, and the average value of four points is shown. Fundamentally, the closer the dimensional change rate is to 0%, the better the dimensional stability is. $\alpha(\%) = \{(L_0 - L_1) / L_0\} \times 100$ L₀: length between gauge points before heating and cooling, L₁: length between gauge marks after heat treatment at 160 ° C. for 1 hour,

Evaluation method of heat resistance of laminate The heat resistance of the laminate was measured by measuring the solder heat resistance by the following method. A test piece (25 mm x 25 mm) was immersed in a molten solder bath (260 ° C, ± 1 ° C), and the time until a popping sound was measured. This time (second) was used as an index of heat resistance. The higher the value, the better the heat resistance. Method for Evaluating Electrical Characteristics of Laminated Plate The electrical characteristics of the laminated plate were evaluated by measuring the insulation resistance of the substrate according to JIS-C6481. The measurement was performed under normal conditions and after boiling (100 ° C, 2 hours). The higher the insulation resistance, the better the electrical characteristics.

Example 1 A pulp slurry composed of bamboo pulp A was mixed with a melamine resin (trade name: Sumitretz Resin: ACB / Sumitomo Chemical Co., Ltd.) 1% with respect to pulp and hand-made in a laboratory square hand-making machine to obtain a basis weight of 125 g / m² and a density of 0.5 g / Cm³ was obtained. A laminate was prepared using the laminate base paper. Example 2 Except that bamboo pulp C was used instead of bamboo pulp A, A laminate base paper and a laminate were obtained in the same manner as in Example 1.

Example 3 Except that bamboo pulp B was used in place of bamboo pulp A, A laminate base paper and a laminate were obtained in the same manner as in Example 1.

Example 4 A pulp formulation was bamboo pulp A 15%, unbeaten bleached kraft pulp from acacia wood from South Africa (hereinafter simply LBK) A laminate base paper and a laminate were obtained in the same manner as in Example 1 except that 85% was also used. Example 5 A laminate base paper and a laminate were obtained in the same manner as in Example 1 except that the pulp content was 75% bamboo pulp A and 25% unbeaten bleached kraft pulp from acacia wood from South Africa. Example 6 A laminate base paper and a laminate were obtained in the same manner as in Example 1 except that the pulp was blended with bamboo pulp A 85% and unbeaten bleached kraft pulp from South African acacia wood 15%.

Comparative Example 1 Instead of bamboo pulp A, unbeaten bleached kraft pulp (LBKP) from acacia wood from South Africa was used (100%). Except for using, a laminate base paper and a laminate were obtained in the same manner as in Example 1. Comparative Example 2 Cotton linter pulp was replaced with bamboo pulp A (1 (00%), except that a laminate base paper and a laminate were obtained in the same manner as in Example 1. Table 1 shows the evaluation results of the laminates obtained in the examples and the comparative examples. The fine fiber content of bamboo pulp A is 14%, the fine fiber content of bamboo pulp B is 3.5%, the fine fiber content of bamboo pulp C is 4%, LB The fine fiber content of KP was 2.5%. As is clear from Table 1, when LBKP is replaced with linter pulp, heat resistance and electrical properties are improved, but dimensional stability is deteriorated (comparison between Comparative Example 1 and Comparative Example 2). Dimensional stability is comparable and heat resistance and electrical properties are improved (Comparative Example 1 and Example 1). Further, by removing the fine fibers of the bamboo pulp, all of the dimensional stability, heat resistance and electrical properties are improved (comparison between Example 1 and Examples 2 and 3). Further, when bamboo pulp and LBKP were used in combination, a laminated base paper having good formation was obtained.

[0018]

[Table 1]

[0019]

As described above, the present invention has an effect of providing a laminate base paper most suitable for producing a laminate having good dimensional stability, heat resistance and electrical characteristics of the laminate. Therefore, its industrial significance is extremely large.

Cited By (7)

Publication number	Priority date	Publication date	Assignee	Title
WO2002028014A1 *	2000-09-18	2002-03-28	Et Eitoku Corporation	Processed board-type products made of non-wooden fibers
KR100776972B1	2007-02-23	2007-11-21	(주) 동양이화	Base of pallet for carrying parts
WO2009050338A1 *	2007-10-18	2009-04-23	Chempolis Oy	Process for improving characteristics of pulp
CN102605669A *	2011-01-20	2012-07-25	宁波六和包装有限公司	Process for improving packaging paper pulp
CN102605673A *	2011-01-20	2012-07-25	宁波六和包装有限公司	Paper pulp improving method
CN103814173A *	2011-09-21	2014-05-21	金佰利·克拉克环球有限公司	Tissue product comprising bamboo
US1053643B2	2017-02-22	2021-07-06	Kimberly-Clark Worldwide, Inc.	Layered tissue comprising non-wood fibers
Family To Family Citations				

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
US4682324A	1987-03-24	Process for the production of laminated sheet
EP1354095B1	2011-03-23	Non-woven sheet of aramid fiber
CN102174770A	2011-09-07	Prepreg containing aromatic synthetic fiber paper and printed circuit board manufactured from same
CN106498807A	2017-03-15	Production technology for the dipping flame retardant type copper coated foil plate base paper of printed wiring board
JPH10102392A	1998-04-21	Base paper for laminated plate, and laminated plate
JP200310823A	2003-03-18	Substrate web for printed circuit board manufacturing using foaming process and acrylic fiber
JP2005299053A	2005-10-27	Substrate for electrical insulation, method for producing the same and prepreg and printed circuit board using the substrate

CN110644289B	2020-06-16	Laminated board base paper and production process thereof
EP1963567B1	2010-10-27	Pipd paper and components made therefrom
JP2005306897A	2005-11-04	Electrical insulating substrate, method for producing the same, prepreg and printed wiring board using the same
JP2005306898A	2005-11-04	Electrical insulating substrate, method for producing the same, prepreg and printed wiring board using the same
JP4580704B2	2010-11-17	Base material for electrical insulation, method for producing the same, and prepreg and printed wiring board using the base material
JP2958092B2	1999-10-06	Laminated board
JP2008127693A	2008-06-05	High-strength material using microcellulose
JP2579494B2	1997-11-19	Manufacturing method of base paper for laminated board
JP2921980B2	1999-07-26	Base paper for laminated board
KR100413301B1	2004-06-23	Laminated Material
JPH09268500A	1997-10-14	Base paper for dielectric laminate
JP4169494B2	2008-10-22	Manufacturing method of non-woven fabric for electrical insulation, and manufacturing method of prepreg and laminate
JP2000273788A	2000-10-03	Para-aromatic polyamide fiber paper and its production
JPH06136687A	1994-05-17	Base paper for electrical insulating laminate board
JPH06128095A	1994-05-06	Base paper for electrical insulating laminate
JPH06128095A	1994-05-10	Base paper for laminated board
JP2943892B2	1999-08-30	Electrically insulating laminate base paper
JP2525706B2	1996-08-21	Manufacturing method of laminated base paper

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
JP25452696A	1996-09-26	1996-09-26	Base paper for laminated plate, and laminated plate

Applications Claiming Priority (1)

Application	Filing date	Title
JP25452696A	1996-09-26	Base paper for laminated plate, and laminated plate

Concepts

machine-extracted

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Name	Image	Sections	Count	Query match
 Bambusa brundinacea		claims,abstract,description	59	0.000
 Bambusa tulda		claims,abstract,description	59	0.000
 Bambuseae		claims,abstract,description	59	0.000
 Phyllostachys viridis		claims,abstract,description	59	0.000
 bamboo		claims,abstract,description	59	0.000
 fiber		claims,abstract,description	44	0.000
 Cellulose fiber		claims,abstract,description	12	0.000
 Pulp (paper)		claims,abstract,description	10	0.000
 resin		claims,abstract,description	9	0.000
 resin		claims,abstract,description	9	0.000
 thermosetting polymer		claims,abstract,description	4	0.000
 laminating		claims,abstract,description	3	0.000
 moulding		claims,description	4	0.000

⌘ phenolic resin	abstract,description	7	0.000
⌘ phenolic resin	abstract,description	3	0.000
⌘ slurry	abstract,description	3	0.000
⌘ epoxy resin	abstract,description	2	0.000
⌘ polyepoxide	abstract,description	2	0.000
⌘ lamination	abstract	3	0.000
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(19) 대한민국특허청(KR)
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전체 청구항 수 : 총 6 항

(54) 홍조섬유를 포함하는 보안용지 및 이의 제조방법

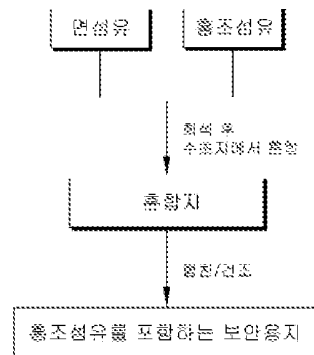
(57) 요약

본 발명은 홍조섬유를 포함하는 보안용지 및 이의 제조방법에 관한 것이다.

본 발명의 홍조섬유를 포함하는 보안용지의 제조방법은, 면섬유와 홍조섬유를 혼합한 후 혼합지를 제조하는 혼합지제조단계와; 제조된 혼합지를 폴리비닐알콜, 전분, 젤라틴이 포함된 함침제에 함침 처리하는 함침처리단계; 함침 처리된 혼합지를 건조하는 건조단계;를 포함하여 구성되며, 혼합지제조단계에서 홍조섬유는 혼합지 100 중량% 대비 5 ~ 30 중량 % 포함되는 것을 특징으로 하고, 혼합지제조단계에서 면섬유와 홍조섬유는 최종지료농도 0.1 ~ 0.5 %로 희석된 후 수조지에서 제조되거나 포머 또는 환팡조지기로 습지층을 형성하는 합지방식에 의하여 제조되는 것을 특징으로 하며, 혼합지제조단계에서 면섬유는 40 ~ 70 ° SR의 여수도로 고해 처리된 것을 특징으로 하고, 함침처리단계는 폴리비닐알콜, 전분, 젤라틴이 5 ~ 7 중량 %로 용해된 수용액을 47 ~ 53 °C의 온도로 유지하면서, 제조된 혼합지를 20 ~ 40 초간 함침시킨 다음 과량을 제거하고, 4 ~ 6 중량 %의 분사액에 3 ~ 7초간 혼합지를 함침한 다음 과량을 제거하는 것을 특징으로 한다.

본 발명에 의하여, 면섬유와 홍조섬유를 혼합하여 보안용지를 제조함으로써 현미경에 의해서 원료의 차별화를 확인할 수 있도록 함으로써 보안용지의 진위식별을 용이하게 하여 용지의 위조를 방지할 수 있고, 면섬유만으로 제조된 경우에 비해 훨씬 미세한 홍조섬유를 혼합함으로써 공극부분을 미세한 홍조섬유가 채워 동일한 평량에서 무기충전제를 첨가하지 않고도 불투명도를 향상시킬 수 있으며, 구김 처리에 따른 기공도의 변화에 있어서 기공도의 증가가 훨씬 적어 구김 처리에 대한 저항이 우수하여 내구성이 우수한 보안용지의 제조 방법이 제공된다.

도 1



특허청구의 범위

청구항 1

보안용지 제조 방법에 있어서,
면섬유와 홍조섬유를 혼합한 후 혼합지를 제조하는 혼합지제조단계와;
상기 제조된 혼합지를 폴리비닐알콜, 전분, 젤라틴이 포함된 함침제에 함침 처리하는 함침처리단계;
상기 함침 처리된 혼합지를 건조하는 건조단계;를 포함하여 구성된,
홍조섬유를 포함하는 보안용지의 제조방법.

청구항 2

제 1항에 있어서,
혼합지제조단계에서 홍조섬유는 혼합지 100 중량% 대비 5 ~ 30 중량 % 포함되는 것을 특징으로 하는,
홍조섬유를 포함하는 보안용지의 제조방법.

청구항 3

제 1항에 있어서,
상기 혼합지제조단계에서 혼합지는 면섬유와 홍조섬유를 혼합한 다음 물을 이용하여 최종지료농도 0.1 ~ 0.5 %로 희석한 후 수초지에서 제조되거나 포머 또는 환망초지기로 습지층을 형성하는 합지방식에 의하여 제조되는 것을 특징으로 하는,
홍조섬유를 포함하는 보안용지의 제조방법.

청구항 4

제 1항에 있어서,
상기 혼합지제조단계에서 면섬유는 40 ~ 70 ° SR의 여수도로 고해 처리된 것을 특징으로 하는,
홍조섬유를 포함하는 보안용지의 제조방법.

청구항 5

제 1항에 있어서,
상기 함침처리단계는 폴리비닐알콜, 전분, 젤라틴이 5 ~ 7 중량 %로 용해된 수용액을 47 ~ 53 °C의 온도로 유지하면서, 제조된 혼합지를 20 ~ 40 초간 함침시킨 다음 과량을 제거하고, 4 ~ 6 중량 %의 붕사액에 3 ~ 7초간 혼합지를 함침한 다음 과량을 제거하는 것을 특징으로 하는,
홍조섬유를 포함하는 보안용지의 제조방법.

청구항 6

보안용지에 있어서,
제 1항 내지 제 5항 중 어느 한 항의 제조방법에 의해 제조된 것을 특징으로 하는,

홍조섬유를 포함하는 보안용지.

보안용지

보안용지

기물문지

본 발명은 현미경에 의한 고배율 및 저배율에서 원로적 차별화에 있어서는 홍조섬유를 혼합하여 제조함으로써 면섬유 100% 만으로 제조된 종이에 비교하여 홍조섬유가 사용되었음을 명확하게 구별할 수 있게 되고, 면섬유만 으로 제조된 경우에 비해 불투명도가 높아졌으며, 불투명도의 감소가 적으며, 은행권의 내구성을 평가하는 방법 의 하나인 구진처리에 따른 기공도의 변화에 있어서도 구진처리에 의한 기공도의 증가가 훨씬 적어 구진처리에 대한 저항성이 우수하여 내구성이 우수한, 홍조섬유를 포함하는 보안용지 및 이의 제조방법에 관한 것이다.

배경기술

지폐 등 과 같은 보안용지의 전위식별을 위한 기술로는 지폐에 금속성 부재와 형광물질을 사용하여 빛에 따른 반 사도를 적용한 '보안 용지'(한국 특허공보 특1993-0006823)이 공개된 바 있다.

이밖에도 보안요소로는 숨은그림(은화, watermark), 보안용 실(은선, security thread) 및 보안용 섬유(채사, security fiber) 등이 사용되어 왔다.

위와 같은 기술들은 용지의 표면에 상기와 같은 그림과 실, 채사를 적용하였는데, 지폐의 위폐 방지 기술이 발 진함에 따라 위폐 기술도 발전하여 상기와 같은 요소로까지 위폐기술이 발전하여 보다 새로운 위폐방지 기술을 필요로 하는 실정이다.

한편, 홍조섬유에 관련한 기술로는, 홍조섬유를 이용하여 필포를 제조하도록 한 '홍조섬유를 이용한 필포의 제조방 법'(한국 등록특허공보 제10-0754890), '외과가 누끼온 홍조섬유를 이용한 필포의 제조방법'(한국 등록특허공보 제10-0811196), '홍조섬유로 제조된 필포 및 그 제조 방법'(한국 등록특허공보 제10-0811193) 등이 공개된 바 있 다.

이들 기술들은 홍조섬유를 산성수용액에 침지하여 홍조섬유 외피에 형성된 단산칼슘을 제거하고, 용매에 의하여 젤 성분을 제거하여 그 잔존물인 잔사를 수집하여 필포화 하는 것을 특징으로 하고 있다.

상기와 같은 기술들은 홍조섬유의 대량생산성 및 친환경적인 측면을 이용하여 홍조섬유를 이용하여 필포를 제조하려 는 것들이다.

위와 같은 홍조섬유에 관한 기술이 안출되었음에도 불구하고 아직까지 홍조섬유를 이용하여 지폐와 같은 보안용지 의 위폐방지 기술로 적용된 바가 없으며, 보안용지의 면섬유와 혼합되었을 때 불투명도가 높아지며, 구진을 방 지할 수 있음이 알려진 바 없다.

상기와 같은 이유로 보안용지의 제조에 있어 기존 섬유조성에서의 용지 물성에 지대한 영향을 미치지 않고 원로 적 차별성을 부여할 수 있어 위폐를 식별할 수 있는 홍조섬유를 포함하는 보안용지 제조기술의 개량이 필요하 다.

본 발명의 목적

본 발명의 목적

본 발명의 홍조섬유를 포함하는 보안용지 및 이의 제조방법은 상기와 같은 종래 기술에서 발생되는 문제점을 해 소하기 위한 것으로, 면섬유와 홍조섬유를 혼합하여 보안용지를 제조함으로써 현미경에 의해서 원로의 차별화를 확인할 수 있도록 함으로써 보안용지의 전위식별을 용이하게 하여 용지의 위조를 방지할 수 있게 하려는 것이다.

또, 면섬유만으로 제조된 경우에 비해 훨씬 미세한 홍조섬유를 혼합함으로써 공극분포를 미세한 홍조섬유가 채 워 동일한 평량에서 무기충전제를 첨가하지 않고도 불투명도를 향상시키려는 것이다.

[0012] 또한, 구김 처리에 따른 기공도의 변화에 있어서 기공도의 증가가 훨씬 적어 구김 처리에 대한 저항이 우수하여 내구성이 우수한 보안용지의 제조 방법을 제공하려는 것이다.

과제 해결수단

- [0013] 본 발명의 홍조섬유를 포함하는 보안용지 제조방법은 상기와 같은 기술적 과제를 해결하기 위하여, 면섬유와 홍조섬유를 혼합한 후 혼합지를 제조하는 혼합지제조단계와; 제조된 혼합지를 폴리비닐알콜, 전분, 젤라틴이 포함된 함침제에 함침 처리하는 함침처리단계; 함침 처리된 혼합지를 건조하는 건조단계;를 포함하여 구성된다.
- [0014] 이때, 혼합지제조단계에서 홍조섬유는 혼합지 100 중량% 대비 5 ~ 30 중량 % 포함되는 것을 특징으로 한다.
- [0015] 또, 혼합지제조단계에서 면섬유와 홍조섬유는 최종지료농도 0.1 ~ 0.5 %로 희석된 후 수초지에서 제조되거나 포머 또는 환망초지기로 습지층을 형성하는 함침방식에 의하여 제조되는 것을 특징으로 한다.
- [0016] 또한, 혼합지제조단계에서 면섬유는 40 ~ 70 ° SR의 여수도로 고해 처리된 것을 특징으로 한다.
- [0017] 또한, 함침처리단계는 폴리비닐알콜, 전분, 젤라틴이 5 ~ 7 중량 %로 용해된 수용액을 47 ~ 53 °C의 온도로 유지하면서, 제조된 혼합지를 20 ~ 40 초간 함침시킨 다음 과량을 제거하고, 4 ~ 6 중량 %의 붕사액에 3 ~ 7초간 혼합지를 함침한 다음 과량을 제거하는 것을 특징으로 한다.

효과

- [0018] 본 발명에 의하여, 면섬유와 홍조섬유를 혼합하여 보안용지를 제조함으로써 현미경에 의해서 원료의 차별화를 확인할 수 있도록 함으로써 보안용지의 진위식별을 용이하게 하여 용지의 위조를 방지할 수 있게 된다.
- [0019] 또, 면섬유만으로 제조된 경우에 비해 훨씬 미세한 홍조섬유를 혼합함으로써 공극부분을 미세한 홍조섬유가 채워 동일한 평량에서 무기충전제를 첨가하지 않고도 불투명도를 향상시킬 수 있게 된다.
- [0020] 또한, 구김 처리에 따른 기공도의 변화에 있어서 기공도의 증가가 훨씬 적어 구김 처리에 대한 저항이 우수하여 내구성이 우수한 보안용지의 제조 방법이 제공된다.

발명의 실시를 위한 구체적인 내용

- [0021] 이하, 본 발명의 홍조섬유를 포함하는 보안용지의 제조방법에 대하여 첨부된 도면 및 사진을 통하여 상세히 설명하기로 한다.
- [0022] 1. 혼합지제조단계
- [0023] 면섬유와 홍조섬유를 혼합한 후 혼합지를 제조한다.
- [0024] 홍조류는 붉거나 자줏빛을 띤 바다 또는 민물 식물로써 우리가 쉽게 알 수 있는 김이나 우뚝가사리목, 돌가사리목, 도박목 및 국수나물목 등이 있다.
- [0025] 이러한 홍조류는 자라는 속도가 매우 빨라 하루에 자기 몸의 3 ~ 7 %까지 성장하여 일년에 다섯 번 정도까지 수확이 가능하다.
- [0026] 홍조류에서 홍조섬유를 추출하는 방법에 대해서는 공지된 다수의 기술이 있으므로 추출 방법에 대해서는 기재 생략하기로 한다.
- [0027] 이러한 홍조섬유는 구입된 제품을 1 중량 %로 물에 충분히 해리하여 사용하는 것이 바람직하다.
- [0028] 면섬유는 40 ~ 70 ° SR의 여수도(또는 고해도)로 고해 처리된 지료를 준비하는 것이 바람직하다.
- [0029] 홍조섬유와 면섬유를 준비한 후에는 면섬유와 홍조섬유를 혼합하여 혼합지를 제조하되, 이때 홍조섬유는 혼합지

100 중량% 대비 5 ~ 30 중량 % 포함되는 것이 가장 바람직하다.

[0030] 혼합지의 제조는, 면섬유와 홍조섬유를 혼합한 다음 물을 이용하여 최종지료농도 0.1 ~ 0.5 %로 희석한 후 수조지에서 제조되거나 포머 또는 환망초지기로 습지층을 형성하는 합지방식에 의하여 제조한다.

[0031] 이때, 수조지 내부의 망은 150 메쉬 정도의 규격을 사용하는 것이 바람직하다.

[0032] 구체적으로 일정한 높이의 원통 내부에 망을 설치한 후 면섬유와 홍조섬유가 희석된 액체를 원통 내부에 부어 면섬유와 홍조섬유의 혼합물이 망에 걸리도록 하여 혼합지를 제조한다.

[0033] 2. 함침처리단계

[0034] 제조된 혼합지를 폴리비닐알콜이 포함된 함침제에 함침 처리한다.

[0035] 보다 구체적으로 5 ~ 7 중량 %로 용해된 폴리비닐알콜 수용액을 47 ~ 53 ℃의 온도로 유지하면서 제조된 혼합지를 20 ~ 40 초간 함침시킨 다음 압착 롤프레스를 통과시켜 과다의 폴리비닐알콜 수용액을 제거한다.

[0036] 이때, 상기 폴리비닐알콜 수용액의 농도는 중량기준으로 물에 대한 폴리비닐알콜의 함량을 나타낸다.

[0037] 상기 폴리비닐알콜 수용액에는 요소, 젤라틴, 전분 등의 첨가제가 첨가되어 있는 것이 바람직하다.

[0038] 폴리비닐알콜 수용액에 함침 처리한 후에는 4 ~ 6 중량 %의 붕사액에 3 ~ 7초간 혼합지를 함침한 다음 역시 압착 롤프레스를 통과시켜 과다의 붕사액을 제거한다.

[0039] 상기 붕사액에는 붕사 및 물 외에도 글리세린, 증점제 등이 포함될 수도 있다.

[0040] 이때, 함침제의 도포량은 혼합지 건량기준으로 5 ~ 7 g/m²가 되도록 하는 것이 바람직하다.

[0041] 아울러, 압착 롤프레스의 압력은 3 ~ 4 kgf/cm²가 바람직하다.

[0042] 3. 건조단계

[0043] 함침 처리된 혼합지를 건조한다.

[0044] 건조 온도는 50~120℃, 바람직하게는 표면온도가 100 ℃가 되도록 건조기를 이용하여 2 ~ 3분간 건조하는 것이 바람직하다.

[0045] 이하, 본 발명의 홍조섬유를 포함하는 보안용지의 제조방법에 대하여 하기 실시예와 비교예를 통하여 본 발명을 좀 더 구체적으로 설명하지만 이에 본 발명의 범주가 한정되는 것은 아니다.

[0046] <실시예 1> 홍조섬유를 포함하는 보안용지의 제조1

[0047] 55±3 ° SR로 고해처리된 면섬유에 홍조섬유를 10 중량% 혼합하여 최종지료농도 0.5%로 희석한 후 실험실용 원형수조지를 이용하여 혼합지를 제조하였다.

[0048] 아울러, 6 중량%로 용해된 폴리비닐알코올 수용액으로 표면 처리액을 제조하였다.

[0049] 상기 표면 처리액을 50 ±3℃로 유지하면서 제조된 혼합지를 표면 처리액에 30 초간 함침한 후 압착 롤프레스 3.5 kgf/cm²의 조건에서 압착하여 과량을 제거하였다.

[0050] 이 후, 상기 혼합지를 5 중량% 농도의 붕사액에 5 초간 함침한 후 압착 롤프레스 3.5 kgf/cm²의 조건에서 압착하여 과량을 제거하였다.

[0051] 함침 과정이 끝난 혼합지를 100℃에서 2분간 건조하여 평량 85±4 g/m²의 보안용지를 제조하였다.

[0052] <비교예 1> 면섬유만으로 제조된 보안용지 제조1

[0053] 65±3 ° SR로 고해처리된 면섬유를 최종지료농도 0.5%로 희석한 후 실험실용 원형수조지를 이용하여 습지를 제

조하였다.

[0054] (아울러, 6 중량%로 용해된 폴리비닐알코올 수용액으로 표면 처리액을 제조하였다.

[0055] 상기 표면 처리액을 50 ±3℃로 유지하면서 제조된 습지를 표면 처리액에 30 초간 함침한 후 압착 롤프레스 3.5 kgf/cm²의 조건에서 압착하여 과량을 제거하였다.

[0056] 이 후, 상기 혼합지를 5 중량% 농도의 붕사액에 5 초간 함침한 후 압착 롤프레스 3.5 kgf/cm²의 조건에서 압착하여 과량을 제거하였다.)

[0057] 함침 과정이 끝난 혼합지를 100℃에서 2분간 건조하여 평량 85±4 g/m²의 보안용지를 제조하였다.

[0058] <실험예 1> 용지 물성 실험

[0059] 상기 실시예 및 비교예에서 제조된 보안 용지를 23℃, 50%의 조건에서 24시간 조습처리한 후 불투명도를 ISO 2471에 따라 측정하여 아래 <표 1>에 나타냈다.

[0060] <표 1> 물성 비교

구분	홍조섬유함량 (중량%)	함침제 량 (g/m ²)	도포 불투명도 (%)		불투명도 감소정도*	
			원지	함침처리지	절대치	감소율
실시예	10	5.1	98.6	98.0	0.6	0.6
비교예	0	5.2	96.4	95.1	1.3	1.3

[0062] * 원지에 대한 함침처리후의 불투명도 감소정도를 의미함

[0063] 실시예에서 제조된 종이의 불투명도는 98.0%로, 비교예에서 제조된 종이의 불투명도인 95.1에 비하여 높았다.

[0064] 또한 함침처리에 의한 불투명도 감소에 있어서도 실시예의 경우 감소율이 비교예에 비하여 훨씬 적은 것을 알 수 있었다.

[0065] <실험예 2> 구김처리에 대한 저항성 평가

[0066] 도 2와 같은 구김장치를 이용하여 8회 구김처리를 실시하여 벤튼(Bendtsen) 방식의 기공도를 측정하여 구김처리에 대한 저항성을 평가하였다.

[0067] 그 결과 홍조섬유가 10% 혼합된 용지의 경우 구김처리에 대한 저항성이 더 높음을 알 수 있었다.

[0068] 아래 <표 2> 및 이를 그래프화한 도 3에 따르면 구김처리에 의하여 기공도가 증가하는 정도가 면섬유만으로 이루어진 비교예의 경우 훨씬 큼을 알 수 있었다.

[0069] <표 2> 기공도 변화

구김처리 횟수	기공도 (mL/min)	
	비교예	실시예
0	0	0
2	5	0
4	11	4
6	20	8
8	26	12

[0071] 8회 구김처리후의 기공도 값을 비교하면, 비교예의 경우 26 mL/min인 반면, 실시예의 경우에는 12 mL/min으로 수치가 훨씬 적어 구김처리에 대한 저항성이 우수하고 결과적으로 내구성이 우수하다고 판단할 수 있었다.

[0072] <실험예 3> 전자현미경 사진

[0073] 실시예의 보안용지를 전자현미경을 이용하여 표면을 고배율 및 저배율로 찍어 도 4 및 도 5의 사진으로 나타냈

다.

[0074]

도 4는 고배율(1,200배)에서 표면을 관찰한 사진으로서, ①로 표시된 섬유가 혼조섬유이며, ②로 표시된 면섬유와 비교하여 섬유의 폭에 있어 큰 차이를 가지며 표면도 매끈한 것을 알 수 있다.

[0075]

반면, ②로 표시된 섬유는 면섬유로 섬유를 종이를 제조하기에 적당한 상태로 기계적인 처리를 하였기 때문에 표면에 결결이 벗겨지고 잔털이 많이 발생하였다.

[0076]

도 5는 동일한 용지를 저배율(200배)에서 표면을 관찰한 사진으로, 저배율에서도 면섬유와의 차이를 분명히 확인할 수 있다.

[0077]

즉, 원미경에 의한 원료적 차별화에 있어서는 혼조섬유를 10 중량 % 혼합한 원시예의 종이에에서도 면섬유 100% 만으로 제조된 종이에 비교하여 혼조섬유가 사용되었음을 명확하게 구별할 수 있었다.

[0078]

고배율에서의 차별화는 물론 저배율에서의 차별화도 우수하였다.

실험예를 기술함

[0079]

본 발명에서 혼조섬유를 포함하는 보안용지는 다양한 보안 용지의 제조에 사용될 수 있으나, 가장 바람직하기로는 은행권 또는 은행권 용지를 제조할 때 사용되는 것이 가장 바람직하다.

도면의 간단한 설명

[0080]

도 1은 본 발명의 혼조섬유를 포함하는 보안용지 및 이의 제조방법을 나타낸 공정도.

[0081]

도 2는 본 발명에서 실험장치로 사용한 구강장치를 나타낸 사진.

[0082]

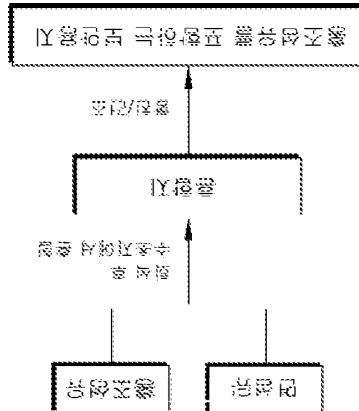
도 3은 본 발명의 혼조섬유를 포함하는 보안용지의 구강 횡수에 따른 기공도 변화를 나타낸 그래프.

[0083]

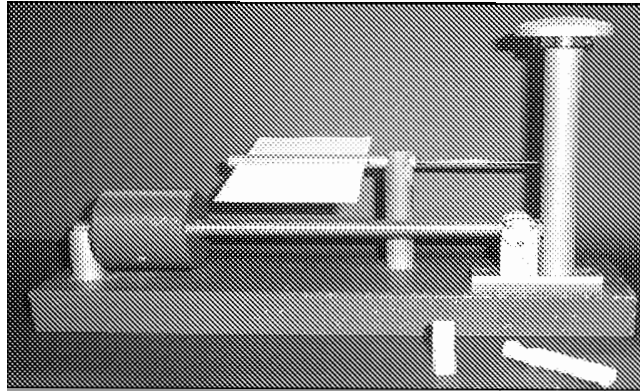
도 4는 본 발명의 혼조섬유를 포함하는 보안용지 표면을 고배율 현미경으로 찍은 사진.

[0084]

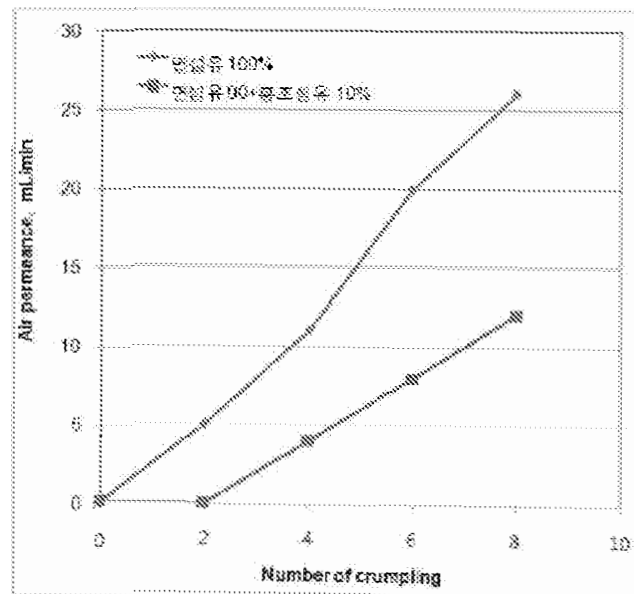
도 5는 본 발명의 혼조섬유를 포함하는 보안용지 표면을 저배율 현미경으로 찍은 사진.



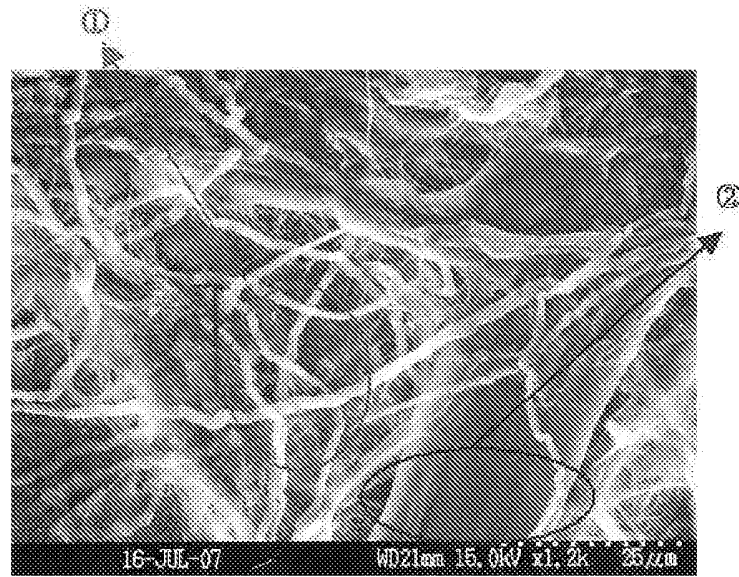
도면2



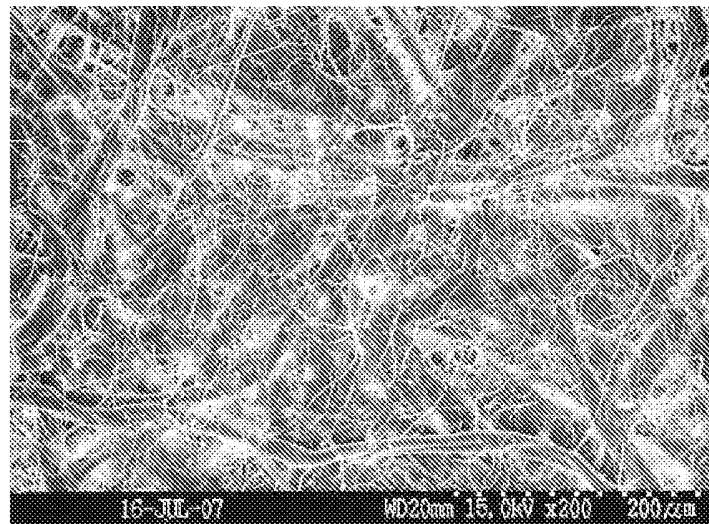
도면3



도면4



도면5

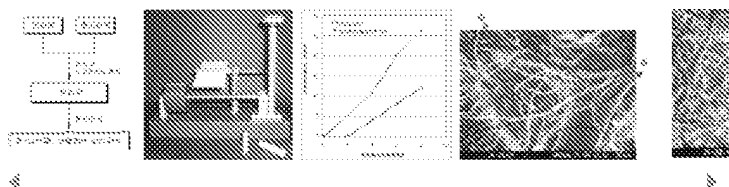


A security paper containing red algae fiber and a method for manufacturing the same

Abstract

PURPOSE: Security paper including red algae fiber and a manufacturing method thereof are provided to easily distinguish authenticity of the security paper by confirming difference of raw materials with a microscope. **CONSTITUTION:** A manufacturing method of security paper including red algae fiber includes the following steps: manufacturing mixed paper by mixing cotton fiber and the red algae fiber; impregnating the mixed paper in an impregnant including polyvinyl alcohol, the starch and gelatin; and drying the impregnated mixed fiber. The red algae fiber of 5 ~ 30 weight% is included in the mixed paper.

Images (5)



Classifications

G01H1/00 Agents facilitating proof of genuineness or preventing fraudulent alteration, e.g. for security paper

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Claims (6)

In the security paper manufacturing method, A mixed paper manufacturing step of preparing a mixed paper after mixing cotton fibers and flushed fibers; An impregnation treatment step of impregnating the prepared mixed paper with an impregnating agent containing polyvinyl alcohol, starch, gelatin; And a drying step of drying the impregnated mixed paper. A method of manufacturing a security paper containing redness fibers. The method of claim 1, in the mixed paper manufacturing step, the red fiber is characterized in that 5 to 30% by weight compared to 100% by weight of mixed paper. A method of manufacturing a security paper containing redness fibers. The method of claim 1, in the mixed paper manufacturing step, the mixed paper is mixed with cotton fiber and red flush fiber, and then diluted with water to a final feed concentration of 0.1 to 0.5%, and then produced in a grass paper or a wet paper layer forming a wetland layer using a former or circular net paper machine. Characterized in that manufactured by. A method of manufacturing a security paper containing redness fibers. The method of claim 1, in the mixed paper manufacturing step, the cotton fiber is treated by beating at 40 ~ 70 ° SR degree of freedom. A method of manufacturing a security paper containing redness fibers. The method of claim 1, in the impregnation treatment step, while maintaining an aqueous solution of polyvinyl alcohol, starch, gelatin dissolved at 5 to 7% by weight at a temperature of 47 to 53 ° C, the prepared mixed paper was impregnated for 20 to 40 seconds, and then excess was removed. Characterized in that to immerse the mixed paper in ~ 6% by weight of borax solution for 3 to 7 seconds and then remove the excess, A method of manufacturing a security paper containing redness fibers. In security paper, it is produced by the manufacturing method of any one of claims 1 to 5, Security paper containing redness fibers.

Description

translated from Korean

A security paper containing red algae fiber and a method for manufacturing the same)

The present invention can be clearly distinguished that the use of red fibers in comparison with the paper made of 100% cotton fibers by mixing the red fibers in the raw material differentiation at high magnification and low magnification by the microscope, if only made of cotton fibers. The opacity is higher than that of the opacity, and the decrease in opacity is small, and the increase in porosity due to the wrinkle treatment is much smaller in the change in porosity due to the wrinkle treatment, which is one of the methods for evaluating the durability of banknotes, and thus the resistance to the wrinkle treatment. The present invention relates to a security paper comprising red fiber and excellent in durability and a manufacturing method thereof.

As a technology for authenticating security papers such as banknotes, a 'security paper' (Korean Patent Publication No. 1993-0036823) applying a reflectance according to light using a metallic member and a fluorescent material has been disclosed.

In addition, as security elements, hidden pictures (silver mark, watermark), security thread (security thread) and security fiber (security yarn) have been used.

The above technologies were applied to the surface of the paper as the picture, thread, and color yarn as described above. As the anti-counterfeiting technology of paper money has developed, the counterfeit technology has been developed, and the counterfeit technology has been developed to the above factors. It is a situation that requires.

On the other hand, as a technique related to the red fiber, 'a method for producing pulp using red algae' (Korea Patent Publication No. 10-0754890), which is to make pulp using red algae, 'a method for producing pulp using thick red skin' (Korean Patent Publication No. 10-0811196), Pulp made of red algae and its manufacturing method (Korean Patent Publication No. 10-0811193) and the like have been published.

These techniques are characterized in that red algae are immersed in an acidic aqueous solution to remove calcium carbonate formed on the red algae shell, and gel components are removed by a solvent to collect and remnant the residue, which is then pulped.

Such techniques are to prepare pulp using red algae using the mass productivity and eco-friendly aspects of red algae.

Despite the above-mentioned technology for flushing fiber, it has not been applied as a counterfeit prevention technology of security papers such as banknotes using red algae yet, and when mixed with cotton fiber of security paper, opacity is increased and wrinkles can be prevented. This is not known.

KR20100070240A

South Korea

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Other languages: Korean

Inventor: 정광진, 김태영, 서용대

Worldwide applications

2008 [KR](#)

Application KR1020080128873A events ⓘ

2008-12-17 Application filed by 한국조폐공사

2008-12-17 Priority to KR1020080128873A

2010-06-25 Publication of KR20100070240A

Info: Cited by (6), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

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translated from Korean

For the above reasons, in the manufacture of security paper, it is necessary to develop a security paper manufacturing technology including flushing fiber that can identify the counterfeit because it can give a differentiation of raw materials without significantly affecting the paper properties in the existing fiber composition. Do.

Security paper comprising the red fiber of the present invention and its manufacturing method is to solve the problems caused in the prior art as described above, by checking the differentiation of the raw material by the microscope by producing a security paper by mixing cotton fibers and red flush fibers. By making it possible to facilitate the authenticity of the security paper to prevent forgery of the paper.

In addition, by mixing the finer flushing fibers compared to the case made with only cotton fibers to fill the pores with fine flushing fibers to improve the opacity without adding an inorganic filler in the same basis weight.

In addition, the increase in porosity in the change of porosity due to the wrinkle treatment is to provide a method of producing a security paper excellent in durability with excellent resistance to the wrinkle treatment.

Security paper manufacturing method comprising the flushing fiber of the present invention, in order to solve the above technical problem, a mixed paper manufacturing step of mixing the cotton fiber and the flushing fiber to produce a mixed paper, An impregnation treatment step of impregnating the prepared mixed paper with an impregnating agent containing polyvinyl alcohol, starch, gelatin; it is configured to include; drying step of drying the impregnated mixed paper.

At this time, in the mixed paper manufacturing step, the red fiber is characterized in that 5 to 30% by weight compared to 100% by weight of mixed paper.

In the mixed paper manufacturing step, the cotton fiber and the redness fiber are produced by dilution to 0.1 ~ 0.5% of the final feed concentration, and then produced by a lamination method of forming a wetland layer with a former or circular net paper machine.

In addition, the cotton fiber in the mixed paper manufacturing step is characterized in that treated by beating at 40 ~ 70 ° SR free water.

In addition, the impregnation treatment step is while impregnating the prepared mixed paper for 20 to 40 seconds while maintaining an aqueous solution of polyvinyl alcohol, starch, gelatin dissolved in 5 to 7% by weight at a temperature of 47 ~ 53 °C, and then remove the excess, 4 to 6% by weight of the borax solution is characterized in that the mixture is impregnated for 3 to 7 seconds and then the excess is removed.

According to the present invention, it is possible to prevent the forgery of the paper by facilitating the authenticity of the security paper by making the differentiation of the raw material by the microscope by mixing the cotton fiber and the red fiber to make the security paper.

In addition, by mixing the finer flushing fibers compared to the case made with only cotton fibers it is possible to improve the opacity without the addition of an inorganic filler at the same basis by filling the pores with fine flushing fibers.

In addition, the increase in porosity in the change of porosity due to the wrinkle treatment is much less excellent resistance to the wrinkle treatment is provided a method of producing a security paper with excellent durability.

Hereinafter, a method for manufacturing a security paper including the flushing fiber of the present invention will be described in detail with reference to the accompanying drawings and photos.

1. Mixed paper manufacturing step

After mixing the cotton fibers and flushing fibers to prepare a mixed paper.

Red algae are red or purplish seas or freshwater plants, and we can easily find seaweed, wood, stone, gambling and noodles.

These red algae grow so fast that they grow up to 3-7% of their body in a day and can harvest up to five times a year.

Since there are a number of known techniques for extracting red fiber from red algae, description thereof will be omitted.

Such flushing fibers are preferably used by dissociating the purchased product in water at 1% by weight.

Cotton fibers are preferably prepared by treating the treated material with a degree of freedom (or high degree) of 40 to 70 ° SR.

After preparing the red fiber and the cotton fiber to prepare a mixed paper by mixing the cotton fiber and the red fiber, wherein the red fiber is most preferably contained 5 to 30% by weight compared to 100% by weight of the mixed paper.

The production of mixed paper is made by mixing the cotton fiber and the redness fiber and diluting it to 0.1 ~ 0.5% of the final feed concentration using water, and then manufacturing it in a grass paper or forming a wetland layer with a former or circular net paper machine. .

At this time, it is preferable to use a standard of about 150 mesh for the network inside the paper.

Specifically, after the mesh is installed in a cylinder of a certain height, a mixture of cotton fibers and redness fibers is poured into the cylinder by pouring a diluted liquid of cotton fibers and flushing fibers into the cylinder to prepare a mixed paper.

2. Impregnation Treatment Step

The prepared mixed paper is impregnated with an impregnating agent containing polyvinyl alcohol.

More specifically, the polyvinyl alcohol solution dissolved at 5 to 7% by weight was impregnated with a mixed paper prepared while maintaining the temperature of 47 to 53 ° C. for 20 to 40 seconds, and then passed through a compression roll press to remove the excess polyvinyl alcohol solution. do.

At this time, the concentration of the polyvinyl alcohol solution indicates the content of polyvinyl alcohol to water on a weight basis.

It is preferable that additives, such as urea, gelatin, and starch, are added to the said polyvinyl alcohol aqueous solution.

After impregnating the polyvinyl alcohol aqueous solution, 4 to 6% by weight of the borax solution is impregnated with the mixed paper for 3 to 7 seconds, and then passed through the compression roll press to remove the excess borax solution.

The borax solution may include, in addition to borax and water, glycerin, a thickener, and the like.

At this time, the coating amount of the impregnant is preferably to be 5 ~ 7 g / m² on the dry paper dry basis.

In addition, the pressure of the compression roll press is preferably 3 to 4 kgf / cm².

3. Drying Step

The impregnated mixed paper is dried.

It is preferable to dry for 2-3 minutes using a dryer so that a drying temperature may be 50-120 degreeC, Preferably surface temperature is 100 degreeC.

Hereinafter, the present invention will be described in more detail with reference to the following examples and comparative examples with respect to a method for manufacturing a security paper including the redness fibers of the present invention, but the scope of the present invention is not limited thereto.

Example 1 Preparation of Security Paper Containing Flushing Fiber 1

After mixing 10% by weight of redness fiber to cotton fiber treated with $55 \pm 3^\circ \text{SR}$, diluted to 0.5% of final paper concentration, mixed paper was prepared using laboratory circular paper.

In addition, the surface treatment solution was prepared with a polyvinyl alcohol aqueous solution dissolved at 6% by weight.

The mixed paper prepared while maintaining the surface treatment solution at $50 \pm 3^\circ \text{C}$. was impregnated in the surface treatment solution for 30 seconds, and then pressed under the conditions of a compression roll press of $3.5 \text{ kgf} / \text{cm}^2$ to remove excess.

Thereafter, the mixed paper was impregnated in a borax solution having a concentration of 5% by weight for 5 seconds, and then compressed under a condition of $3.5 \text{ kgf} / \text{cm}^2$ of a compression roll press to remove excess.

After the impregnation process, the mixed paper was dried at 100°C . for 2 minutes to prepare a security paper having a basis weight of $85 \pm 4 \text{ g} / \text{m}^2$.

Comparative Example 1 Preparation of Security Paper Made of Cotton Fiber 1

After weaving cotton fiber treated with $65 \pm 3^\circ \text{SR}$ at 0.5% final feed concentration, wetlands were prepared using a laboratory circular sheet.

(In addition, the surface treatment liquid was prepared with the polyvinyl alcohol aqueous solution melt dissolved in 6 weight%.

The wetland prepared while maintaining the surface treatment solution at $50 \pm 3^\circ \text{C}$. was impregnated in the surface treatment solution for 30 seconds, and then compressed under a condition of $3.5 \text{ kgf} / \text{cm}^2$ of a compression roll press to remove excess.

Thereafter, the mixed paper was impregnated in a 5 wt% borax solution for 5 seconds, and then compressed under a condition of $3.5 \text{ kgf} / \text{cm}^2$ of a compression roll press to remove excess.)

After the impregnation process, the mixed paper was dried at 100°C . for 2 minutes to prepare a security paper having a basis weight of $85 \pm 4 \text{ g} / \text{m}^2$.

Experimental Example 1 Paper Physical Properties

The security papers prepared in Examples and Comparative Examples were subjected to humidity control for 24 hours at 23°C . and 50% of conditions, and then the opacity was measured according to ISO 2471 and shown in Table 1 below.

<Table 1> Property comparison

division

Redness fiber content (% by weight) Impregnation amount (g / m^2) Opacity (%) Opacity Reduction * Paper Impregnation Paper Absolute Reduction Example 10 5.1 98.6 98.0 0.6 0.6 Comparative example 0 5.2 95.4 95.1 1.3 1.3

* It means the degree of opacity reduction after impregnation treatment on original paper.

The opacity of the paper produced in the example was 98.0%, higher than that of 95.1, which is the opacity of the paper produced in the comparative example.

In addition, in the case of reducing the opacity by the impregnation treatment, it was found that the reduction rate was much smaller than that of the comparative example.

Experimental Example 2 Evaluation of Resistance to Wrinkle Treatment

The crease treatment was performed eight times using the wrinkle apparatus as shown in FIG. 2 to measure the porosity of the Bendtsen method to evaluate the resistance to the wrinkle treatment.

As a result, it was found that the paper with 10% redness fibers was more resistant to wrinkles.

According to <Table 2> and FIG. 3 graphing the same, it was found that the degree of increase in porosity by the wrinkle treatment was much greater in the case of a comparative example consisting of cotton fibers only.

<Table 2> Porosity Change

Number of times Porosity (mL / min) Comparative example Example 0 0 2 5 0 4 11 4 6 20 8 8 26 12

Comparing porosity values after 8 times of goji treatment, it was 26 mL / min in the comparative example, while the value was much smaller as 12 mL / min in the example, which is excellent in resistance to wrinkle treatment and consequently excellent in durability. Could.

Experimental Example 3 Electron Microscope

The security paper of the embodiment was taken with a high magnification and a low magnification by using an electron microscope, and the photographs of FIGS. 4 and 5 were shown.

Figure 4 is a photograph of the surface observed at a high magnification (1,200 times), it can be seen that the fiber represented by ① is a redness fiber, has a large difference in the width of the fiber compared to the cotton fiber represented by ② and smooth surface.

On the other hand, the fibers marked with ② are cotton fibers, and the fibers are peeled on the surface due to mechanical treatment in a state suitable for producing paper, and a lot of fine hair is generated

Figure 5 is a photograph of the surface of the same paper at a low magnification (200 times), it can be clearly seen the difference from the cotton fiber even at low magnification.

That is, in the raw material differentiation by the microscope, even in the paper of the example in which 10% by weight of the flushing fibers were mixed, it was clearly distinguished that the flushing fibers were used as compared to the paper made of only 100% of the cotton fibers.

Differentiation at low magnification was excellent as well as differentiation at high magnification.

In the present invention, the security paper containing the flushing fibers may be used in the manufacture of various security paper, but most preferably used in the manufacture of banknotes or banknote paper.

1 is a process paper showing a security paper and a manufacturing method comprising the flushing fibers of the present invention.

Figure 2 is a photograph showing a wrinkle apparatus used as an experimental apparatus in the present invention.

Figure 3 is a graph showing the porosity change according to the number of times the wrinkles of the security paper containing the flushing fibers of the present invention.

Figure 4 is a photograph taken with a high magnification microscope the surface of the security paper containing the flushing fibers of the present invention.

Figure 5 is a photograph taken with a low magnification microscope the surface of the security paper containing the flushing fibers of the present invention.

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Publication number	Priority date	Publication date	Assignee	Title
WO2013013813A1 *	2011-07-28	2013-01-31	Cargill, Incorporated	Compositions for use in the wet-end of papermaking
US8574400B1	2012-05-25	2013-11-05	Kimberly-Clark Worldwide, Inc.	Tissue comprising macroalgae
US9074324B2	2013-06-10	2015-07-07	Kimberly-Clark Worldwide, Inc.	Layered tissue structures comprising macroalgae
US9499941B2	2012-05-25	2016-11-22	Kimberly-Clark Worldwide, Inc.	High strength macroalgae pulps
US11053643B2	2017-02-22	2021-07-06	Kimberly-Clark Worldwide, Inc.	Layered tissue comprising non-wood fibers
WO2023080372A1 *	2021-11-08	2023-05-11	주식회사 마린아노베이션	Coated paper comprising chitosan coating layer and manufacturing method thereof
Family To Family Citations				

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
US8658273B2	2014-02-25	Security sheet comprising a transparent or translucent layer
KR20100070240A	2010-06-25	A security paper containing red algae fiber and a method for manufacturing the same
RU2491353C1	2010-10-10	Protected document with dirt and/or moisture resistance
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KR100484308B1	2006-11-24	The method for improving the durability of the banknote paper
RU2681001C1	2019-03-01	Method of manufacturing paper resistant to moisture and pollution, and paper resistant to moisture and pollution
JP2016074998A	2016-05-12	Transparent paper and method for producing the same
KR101178727B1	2012-08-31	Paper comprising bleached wood flour and preparation method thereof
KR20150080076A	2015-07-09	Manufacturing method of Paper with high folding endurance using fourdrinier system and paper manufactured by the same method
KR100711374B1	2007-05-02	Durability-reinforced security documents and method for manufacturing the same
Yang et al.	2012	Changes in Layer Properties and Physical Properties of Papers from Old Corrugated Container Fibres with PDADMAC/HEC

Polyelectrolyte Multilayers		
CN101914882A	2010-12-15	Production process for cotton paper

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
KR1020080128873A	2008-12-17	2008-12-17	A security paper containing red algae fiber and a method for manufacturing the same

Applications Claiming Priority (1)

Application	Filing date	Title
KR1020080128873A	2008-12-17	A security paper containing red algae fiber and a method for manufacturing the same

Legal Events

Date	Code	Title	Description
2008-12-17	A201	Request for examination	
2010-11-10	E902	Notification of reason for refusal	
2011-07-26	E601	Decision to refuse application	

Concepts

machine-extracted

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Name	Image	Sections	Count	Query match
fiber		title,claims,abstract,description	51	0.000
manufacturing process		title,claims,abstract,description	35	0.000
Rhodophyta		title,abstract,description	16	0.000
Cotton		claims,abstract,description	29	0.000
Polyvinyl alcohol		claims,abstract,description	14	0.000
polyvinyl alcohol		claims,abstract,description	14	0.000
mixing		claims,abstract,description	12	0.000
drying		claims,abstract,description	7	0.000
Gelatin		claims,abstract,description	6	0.000
Starch		claims,abstract,description	6	0.000
gelatin		claims,abstract,description	6	0.000
gelatin		claims,abstract,description	6	0.000
gelatine		claims,abstract,description	6	0.000
gelatine desserts		claims,abstract,description	6	0.000
starch		claims,abstract,description	6	0.000
starch		claims,abstract,description	6	0.000
solution		claims,description	15	0.000
Erythema		claims,description	14	0.000
impregnation		claims,description	11	0.000
sodium tetraborate		claims,description	8	0.000
sodium tetraborate		claims,description	8	0.000
aqueous solution		claims,description	7	0.000
water		claims,description	6	0.000

⌵ polyvinyl alcohol	claims,description	4	0.000
⌵ chemical substances by application	claims,description	3	0.000
⌵ Cannabis sativa	claims,description	2	0.000
⌵ heating	claims,description	2	0.000
⌵ raw material	abstract,description	6	0.000
Show all concepts from the description section			

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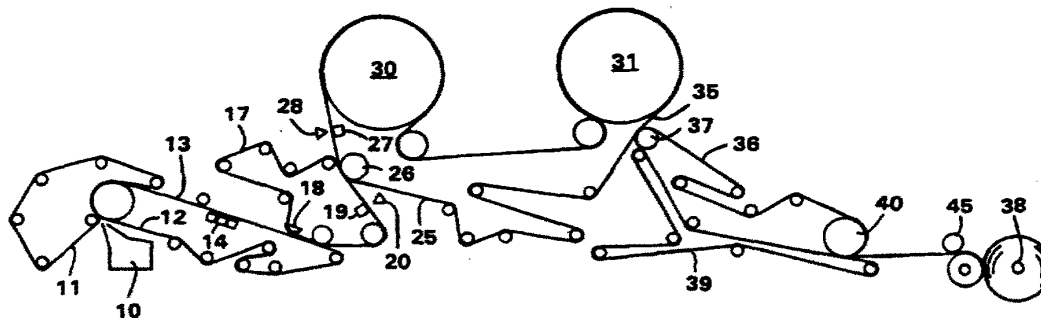
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(54) Title: SOFT LAYERED TISSUES HAVING HIGH WET STRENGTH



(57) Abstract

Tissues having a combination of softness and good wet strength are made by producing a multi-layered tissue in which debonding agents and wet strength agents are provided in separate layers. The wet strength agents are provided in the central layer(s) and the debonding agents are provided in the outer layer(s) of the tissue.

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SOFT LAYERED TISSUES HAVING HIGH WET STRENGTHBackground of the Invention

5 In the manufacture of tissue paper useful as facial tissue, bath
tissue, paper towels and the like, it is well known to use various
additives to enhance the properties of the product. Such additives
include wet strength agents, which can be permanent or temporary, and
debonding agents. As the name implies, wet strength agents impart
10 strength retention to the tissue sheet when it becomes wet by
creating or retaining certain fiber-to-fiber bonds that withstand the
presence of water or moisture, which is particularly useful for most
tissue applications. Temporary wet strength agents are especially
useful for bath tissue, where wet strength is needed while the tissue
is being used, but is undesirable after the tissue has been flushed
15 into the sewer system. Debonding agents are desirable for the
purpose of enhancing the softness of the tissue sheet by reducing the
number of papermaking bonds between fibers and enhancing the surface
feel of the tissue.

20 However, the action of debonding agents inherently is counter to
the objective of the wet strength agents, since the debonding agents
can prevent the wet strength agents from forming the desired bonds.
Hence there is a need for a means of combining wet strength agents
and debonders which minimizes the counterproductive interaction of
the two classes of chemicals and enables the manufacture of tissue
25 sheets having the beneficial properties of softness and wet strength.

Summary of the Invention

It has now been discovered that debonding agents and wet strength agents can be added to a tissue sheet in a layer-wise fashion to maximize the effectiveness of each additive while
5 minimizing the interaction of the additives with each other. This enables the papermaker to take full advantage of the properties of the additives and the fibers within the various layers of the tissue, resulting in a soft, yet strong, tissue.

Hence in one aspect, the invention resides in a method for
10 making a soft tissue sheet comprising (a) forming a layered wet web of papermaking fibers using a layered headbox, said layered wet web having a first outer layer, a second outer layer, and at least one inner layer, wherein the two outer layers comprise predominantly hardwood fibers and said at least one inner layer contains a wet
15 strength agent and comprises predominantly softwood fibers, and wherein at least the first outer layer contains a debonding agent; (b) transferring the layered wet web to a throughdrying fabric wherein said second outer layer is in contact with the throughdrying fabric; and (c) throughdrying the web to form a soft tissue sheet.
20 The resulting throughdried web can be creped or uncreped. In an alternative embodiment, the layered web of step (a) can be dried in accordance with conventional "wet-pressing" processes wherein the web is carried by a papermaking felt, pressed against the surface of a Yankee dryer, dried and creped to produce a soft tissue sheet.

25 In another aspect, the invention resides in a soft layered tissue comprising two outer layers and at least one inner layer, wherein said two outer layers contain predominantly hardwood fibers and at least one of the two outer layers, such as the airside layer (hereinafter described), contains a debonding agent, and wherein said
30 at least one inner layer contains predominantly softwood fibers and a wet strength agent. The tissue can be throughdried or wet-pressed and can be creped or uncreped.

As used herein, a "debonding agent" is an additive that enhances the softness of tissue paper. The debonding agents may accomplish
35 this by a variety of means: a) by interfering with formation of hydrogen bonds, such as with fatty quaternary ammonium compounds (debonder); b) by increasing the lubricity of the fibers and

increasing flexibility of the web, such as with fatty acid salts and derivatives (e.g., fatty amine derivatives) and silicones;
c) reducing surface tension and thereby reducing Campbell's forces during web formation, resulting in reduced bonded area, such as with
5 surfactants; or d) by other means or combinations of means. Suitable debonding agents include, without limitation, alkyl trimethyl quaternary ammonium compounds, dialkyl dimethyl quaternary ammonium compounds, trialkyl methyl quaternary ammonium compounds, dialkoxy alkyl quaternary ammonium compounds, dialkoxy alkyl quaternary
10 ammonium compounds, diamidoamine quaternary compounds, imidazolinium quaternary ammonium compounds, fatty acid derivatives, nonionic surfactants, ampholytic surfactants, silicones, methyl cellulose, hydroxypropyl cellulose, methyl hydroxyethyl cellulose, methyl hydroxypropyl cellulose, methyl hydroxybutyl cellulose,
15 carboxyethylmethyl cellulose, and mixtures thereof.

The debonding agents are preferably incorporated into the outer layer(s) by addition into the layer furnish prior to formation of the web. However, the debonding agents can also be applied to the wet web after formation by spraying the debonding agent onto the web,
20 before drying of the web. In such instances the consistency of the wet web can be about 40 percent or less, more specifically about 30 percent or less, and still more specifically about 20 percent or less. The amount of debonding agent applied to the outer layer(s) can be from about 0.125 kg/tonne per layer (0.25 lb./ton per layer)
25 to 25 kg/tonne per layer (50 lb./ton per layer).

As used herein, a "wet strength agent" is an additive that increases the strength of wet tissue paper. It can provide permanent or temporary wet strength to the tissue. Suitable wet strength agents include, without limitation, urea-formaldehyde resins,
30 melamine-formaldehyde resins, epoxidized polyamide resins, polyamine-polyamide-epichlorohydrin resins, glyoxalated polyacrylamide resins, polyethylenimine resins, temporary wet strength resins described in U.S. Patent No. 4,981,577 to Bjorkquist issued January 1, 1991, herein incorporated by reference, dialdehyde starch, cationic
35 aldehyde starch, cellulose xanthate, synthetic latexes, vegetable gums, glyoxal, acrylic emulsions and amphoteric starch siloxanes.

The amount of wet strength agent added to the inner layer of softwood fibers can be from 0.25 kg/tonne/layer (0.5 lb./ton) to 25 kg/tonne/layer (50 lb./ton).

5 Brief Description of the Drawing

Figure 1 is a schematic flow diagram of a tissue making process useful for purposes of this invention.

Detailed Description of the Drawing

10 Referring to Figure 1, a method of making multi-layered tissues suitable for purposes of this invention will be described. (For simplicity, the various tensioning rolls schematically used to define the several fabric runs are shown but not numbered.) It will be appreciated that variations from the apparatus and method illustrated
15 in Figure 1 can be made without departing from the scope of the invention. Shown is a twin wire former having a layered papermaking headbox 10 which injects or deposits an aqueous suspension of papermaking fibers between outer forming fabric 11 and inner forming fabric 12. Inner forming fabric 12 serves to support and carry the
20 newly-formed wet web 13 downstream in the process as the web is partially dewatered to a consistency of about 10 dry weight percent. Additional dewatering of the wet web can be carried out, such as by vacuum suction 14, while the wet web is supported by the forming fabric. As shown, the dryerside layer of the wet web, which is the
25 outer layer of the web that ultimately faces the dryer surface during drying, is in contact with the forming fabric 12. The airside layer is the outer layer on the opposite side of the web and faces away from the dryer during drying.

 The wet web is then transferred from the inner forming fabric
30 to a transfer fabric 17 traveling at a slower speed than the forming fabric in order to impart increased stretch into the web. Transfer is preferably carried out with the assistance of a vacuum shoe 18 and a kiss transfer to avoid substantial compression of the wet web. Optional vacuum box 19 can be used to further dewater the web and
35 spray applicator 20 can be used to provide controlled addition of additives such as debonders.

The web is then transferred from the transfer fabric 17 to the throughdrying fabric 25 with the aid of a vacuum transfer roll 26. The throughdrying fabric can be traveling at about the same speed or a different speed relative to the transfer fabric. If desired, the throughdrying fabric can be run at a slower speed to further enhance stretch. Transfer is preferably carried out with vacuum assistance to ensure deformation of the sheet to conform to the throughdrying fabric, thus yielding desired bulk and appearance. Optional vacuum box 27 and spray applicator 28 can be used as described above.

The level of vacuum used for the web transfers can be from about 3 to about 15 inches of mercury (75 to 380 millimeters of mercury), preferably about 5 inches (125 millimeters) of mercury. The vacuum shoe (negative pressure) can be supplemented or replaced by the use of positive pressure from the opposite side of the web to blow the web onto the next fabric in addition to or as a replacement for sucking it onto the next fabric with vacuum. Also, a vacuum roll or rolls can be used to replace the vacuum shoe(s).

While supported by the throughdrying fabric 25, the web is dried to a consistency of about 94 percent or greater by the throughdryers 30 and 31. The dried basesheet 35 is transferred to carrier fabric 36 with the aid of vacuum roll 37 and transported to the reel 38 using carrier fabric 36 and an optional additional carrier fabric 39. An optional pressurized turning roll 40 can be used to facilitate removal of the web from the carrier fabric 36. Suitable carrier fabrics for this purpose are Albany International 84M or 94M and Asten 959 or 937. Reel calender 45 or subsequent off-line calendering can be used to improve the smoothness and softness of the basesheet, if desired.

Examples

Example 1.

A pilot scale twin wire papermaking machine, as described in Figure 1, was used to produce tissues in accordance with this invention. More specifically, the papermaking machine had a layered headbox with a top chamber, two central chambers, and a bottom chamber. A first fibrous slurry composed primarily of short papermaking fibers, namely eucalyptus hardwood kraft (EHWK), was

pumped through the top and bottom headbox chambers and, simultaneously, a second fibrous slurry composed primarily of long papermaking fibers, namely northern softwood kraft (NSWK), was pumped through the central headbox chambers and delivered in superposed
5 relation between the inner and outer forming fabrics to form thereon a three-layered embryonic (wet) web. The inner and outer forming fabrics were Asten 866 fabrics. The dry weight ratio of the three layers (outer layer/inner layer/outer layer), referred to as the layer split, was 37.5%/25%/37.5%.

10 The EHWK fibers of the first slurry had been previously processed in a Maule shaft disperser with a power input of 80kW at a consistency of about 34% and at a temperature of about 184°F. The resulting EHWK fibers were treated with Berocell 596 debonder in the machine chest at a rate of 5 kg/tonne. Berocell 596 is a dimethyl
15 dialkyl ammonium chloride debonder supplied by Eka-Nobel. Fiber consistency of the first slurry was about 0.12%.

The NSWK fibers of the second slurry were treated with Parex 631 NC temporary wet strength resin at a rate of 5.45 kg/tonne. (Parex 631 NC is a glyoxalated cationic polyacrylamide resin supplied
20 by Cytec.) The second fibrous slurry was also mechanically refined to maintain target tensile strengths. Fiber consistency of the second slurry was about 0.04%.

Partial dewatering of the embryonic web through the forming fabric was assisted by vacuum boxes. The embryonic web was
25 transferred from the inner forming fabric to a Lindsay 3080-CCW transfer fabric with the assistance of a vacuum transfer shoe at a consistency of about 29%. The speed of the forming fabric was about 2285 feet/minute and the speed of the transfer fabric was about 1800 feet/minute, yielding a negative draw (rush transfer) of 27%.

30 The web was then transferred from the transfer fabric to the throughdryer fabric (Asten Velostar 800) at a consistency of about 29%. The web was dried by the throughdriers to a consistency of about 94%. The dried web was transferred to the reel between two transfer fabrics (Asten 866 and Lindsay 3070) and wound into a roll
35 on the reel.

The resulting tissue paper had a basis weight of 29 g/m², geometric mean tensile of 710 g/3 inches, wet CD tensile of 123 g/3

inches (7.62 centimeters), wet/dry tensile ratio of 20.3% and a bulk of 12.5 cc/g. The tissue paper had high tactile softness as determined by panel evaluation.

5 Example 2.

A three-layer tissue paper sheet was produced in accordance with Example 1, except that the first short fiber slurry did not contain a debonding agent. Instead the outer EHWK layers of the undried web were sprayed with a solution of Berocell 596 debonding agent. The
10 debonding agent solution was applied to the outer layers using spray applicators 20 and 28 and corresponding vacuum boxes 19 and 27 as shown in Figure 1. The debonding agent was applied to the outer layers at a rate of 5 kg. debonding agent/tonne of EHWK fiber. Fiber consistency of the web at the point of spray addition was about 29%.
15 The resulting tissue paper had a basis weight of 28.6 g/m², geometric mean tensile of 723 g/3 inches, wet CD tensile of 113 g/3 inches (7.62 centimeters), wet/dry tensile ratio of 19.3% and a bulk of 12.2 cc/g. The tissue paper had high tactile softness as determined by panel evaluation.

20

Example 3.

A three-layer tissue paper sheet was produced in accordance with Example 1, except: 1) the first short fiber slurry (EHWK) was treated with 7.5 kg/tonne of Berocell 584 debonding agent (Berocell 584 is a
25 nonionic, cationic surfactant system supplied by Eka-Nobel); 2) the second long fiber slurry (NSWK) was treated with 6.36 kg/tonne of Parex 631 NC temporary wet strength agent; 3) the negative draw between the forming fabric and transfer fabric was 29%; 4) the layer split was 40%/20%/40%; 5) the inner and outer forming fabrics were
30 Lindsay 2164 fabrics, the wet end transfer fabric was an Albany 94-MSS, the TAD fabric was a Lindsay T216-3, and the dry end transfer fabrics were an Albany 94-M and a Lindsay 3070; and 6) the transfer from the inner forming fabric to the transfer fabric occurred at a consistency of about 26% and the transfer to the TAD fabric occurred
35 at a consistency of about 27%.

The resulting tissue paper had a basis weight of 27.8 g/m², geometric mean tensile of 696 g/3 inches, wet CD tensile of 102 g/3

inches (7.62 centimeters), wet/dry tensile ratio of 18.1% and a bulk of 11.31 cc/g. The tissue paper had high tactile softness as determined by panel evaluation.

5 Example 4.

A three-layer tissue paper sheet was produced in accordance with Example 3, except: 1) the first short fiber slurry was composed of southern hardwood kraft fibers (SHWK); 2) the second long fiber slurry (NSWK) had been treated with 9.66 kg/tonne of Parez 631 NC temporary wet strength agent; 3) the layer split was 40%/20%/40%; and 10 4) the transfer from the inner forming fabric to the transfer fabric occurred at a consistency of about 28% and the transfer to the TAD fabric occurred at a consistency of about 29%.

The resulting tissue paper had a basis weight of 29.4 g/m², 15 geometric mean tensile of 726 g/3 inches, wet CD tensile of 107 g/3 inches (7.62 centimeters), wet/dry tensile ratio of 18.1% and a bulk of 9.95 cc/g. The tissue paper had high tactile softness as determined by panel evaluation.

20 Example 5.

A three-layer tissue paper sheet was produced in accordance with Example 2, except: 1) the outer layers of the undried web were sprayed with Ucarsil HCP textile softener (debonding agent) at a rate of 10 kg Ucarsil HCP/tonne EHWK (Ucarsil HCP is an organomodified 25 silicone softener obtained from Union Carbide); 2) the second long fiber slurry (NSWK) was treated with 4.33 kg/tonne of Parez 631 NC temporary wet strength agent; 3) the negative draw between the forming fabric and transfer fabric was 30%; 4) the layer split was 35%/30%/35%; 5) the wet end transfer fabric was an Albany 94-M, the 30 TAD fabric was a Lindsay T216-4, and the dry end transfer fabrics were both Lindsay 3070 fabrics; and 6) the dried web was calendered using a reel calender consisting of a 20-inch steel roll and a 20.5-inch rubber roll (110 P&J hardness, 0.75 inch cover thickness) engaged to a nip width of about 32 millimeters.

35 The resulting tissue paper had a basis weight of 30.1 gm/m², geometric mean tensile of 679 g/3 inches, wet CD tensile of 100g/3 inches (7.62 centimeters), wet/dry tensile ratio of 18.1% and a bulk

of 8.35 cc/g. The tissue paper had high tactile softness as determined by panel evaluation.

Example 6.

5 A pilot scale twin wire through air dried papermaking machine, similar to that described in Figure 1 but having a Yankee dryer between roll 40 and the reel 38, was used to produce a creped, throughdried tissue in accordance with this invention.

10 The paper machine had a layered headbox with a top chamber, two central chambers, and a bottom chamber. A first fibrous slurry composed of southern hardwood kraft (SHWK) fibers was pumped through the top and bottom headbox chambers, and, simultaneously, a second fibrous slurry composed of northern hardwood kraft fibers (NHWK) was pumped through the central headbox chambers and delivered in
15 superposed relation onto the forming fabric to form thereon a three-layer embryonic web. The layer split was 33.3%/33.3%/33.3%.

The SHWK fibers pumped through the top chamber of the headbox were treated with 2.5 kg/tonne of Berocell 596 debonding agent. The NSWK fibers of the second long fiber slurry were treated with Parex
20 631 NC temporary wet strength resin at a rate of 8.15kg/tonne. The second fibrous slurry was also treated with sufficient starch to maintain target tensile strengths. The SHWK fibers pumped through the bottom chamber of the headbox were untreated.

Dewatering of the embryonic web occurred through the forming
25 fabric and was assisted by vacuum boxes. The embryonic web was transferred from the forming fabric to a transfer fabric with the assistance of a vacuum transfer roll at a consistency of about 29%. The web was then transferred from the transfer fabric to the throughdryer fabric at a consistency of about 29%. The web was dried
30 by the throughdriers to a consistency of about 94%, adhered to a Yankee dryer, creped off the Yankee with a doctor blade, and wound into a roll on the reel.

The resulting tissue paper had a basis weight of 27.1g/m², geometric mean tensile of 768g/3 inches, wet CD tensile of 107 g/3
35 inches (7.62 centimeters), wet/dry tensile ratio of 20.0% and a bulk of 7.88cc/g. The tissue paper had high tactile softness as determined by panel evaluation.

Example 7.

A pilot scale crescent former wet-pressed papermaking machine was used to produce a creped tissue in accordance with this invention.

The paper machine had a layered headbox with a top chamber, a center chamber, and a bottom chamber. A first fibrous slurry composed of EHWK fibers was pumped through the top and bottom headbox chambers, and, simultaneously, a second fibrous slurry composed of NSWK fibers was pumped through the center headbox chamber and delivered in superposed relation onto the felt to form thereon a three-layer embryonic web. The layer split of the embryonic web was 30%/40%/30%.

The EHWK fibers of the first slurry were processed with 1 kg/tonne of BeroCell 584 debonder in a Maule shaft disperser with a power input of 55 kW at a consistency of about 34% and at a temperature of about 178°F.

The NSWK fibers of the second slurry were treated with Kymene 557 LX permanent wet strength resin at a rate of 2.27 kg/tonne. (Kymene 557 LX is a cationic polyamide-epichlorohydrin resin supplied by Hercules, Incorporated.) Forty percent of the second fibrous slurry was mechanically refined to maintain target tensile strengths.

The web was carried by the felt to the Yankee dryer, where the web was adhered to the dryer and then creped off the Yankee with a doctor blade and was wound into a roll on the reel.

The resulting tissue paper had a basis weight of 18.1 lb/2880 ft², geometric mean tensile of 1091 g/3 inches (7.62 centimeters), wet CD tensile of 109 g/3", wet/dry tensile ratio of 13% and a bulk of 6.4 cc/g. The tissue paper had high tactile softness as determined by panel evaluation.

All of the foregoing examples illustrate that a soft tissue having good wet strength can be made by the method of this invention. It will be appreciated that the foregoing examples, given for purposes of illustration, are not to be construed as limiting the scope of this invention, which is defined by the following claims.

We claim:

1. A method for making a soft tissue sheet comprising: (a) forming a layered wet web of papermaking fibers using a layered headbox, said layered wet web having a first outer layer, a second outer layer, and at least one inner layer, wherein the two outer
5 layers comprise predominantly hardwood fibers and said at least one inner layer contains a wet strength agent and comprises predominantly softwood fibers, and wherein at least the first outer layer contains a debonding agent; (b) transferring the layered wet web to a throughdrying fabric; and (c) throughdrying
10 the web.
2. The method of Claim 1 wherein the second outer layer is in contact with the throughdrying fabric;
3. The method of Claim 1 wherein only the first outer layer contains a debonding agent.
4. The method of Claim 1 wherein both outer layers contain a debonding agent.
5. The method of Claim 1 wherein the web has only one inner layer.
6. The method of Claim 1 wherein the web has two inner layers, one of said inner layers substantially containing secondary fibers.
7. The method of Claim 1 wherein the dried web is creped.
8. The method of Claim 1 wherein the dried web is not creped.
9. The method of Claim 1 wherein the debonder is added to the papermaking fibers of the first outer layer prior to forming the wet web.
10. The method of Claim 1 wherein the debonder is sprayed onto the wet web before drying the web.

11. The method of Claim 10 wherein the consistency of the wet web is about 40 percent or less.
12. The method of Claim 10 wherein the consistency of the wet web is about 30 percent or less.
13. The method of Claim 10 wherein the consistency of the wet web is about 20 percent or less.
14. A method for making a soft tissue sheet comprising (a) forming a layered wet web of papermaking fibers using a layered headbox, said layered wet web having first and second layers, wherein said first layer comprises predominantly hardwood fibers and
5 said second layer comprises predominantly softwood fibers, said first layer containing a debonding agent and said second layer contains a wet strength agent; (b) adhering the layered web to the surface of a Yankee dryer with the first layer in contact with the dryer surface; and (c) creping the web.
15. The method of Claim 14 wherein the creped web is plied together with a like web with the second layers in contact with each other to produce a soft two-ply tissue.
16. The method of Claim 14 wherein the layered web comprises a third layer of predominantly hardwood fibers, said third layer being an outer layer.
17. The method of Claim 16 wherein the first and third layers contain a debonding agent.
18. A layered tissue comprising an air side outer layer, a dryer
5 side outer layer and at least one inner layer, wherein said two outer layers contain predominantly hardwood fibers and a debonding agent, and wherein said at least one inner layer contains predominantly softwood fibers and a wet strength agent.

19. A layered, creped, throughdried tissue comprising an airside outer layer, a dryerside outer layer, and at least one inner layer containing predominantly softwood fibers and a wet strength agent, wherein said airside layer contains
5 predominantly hardwood fibers and a debonding agent.
20. A layered, creped wet-pressed tissue comprising an airside outer layer, a dryerside outer layer, and at least one inner layer containing predominantly softwood fibers and a wet strength agent, wherein both outer layers contain predominantly hardwood
5 fibers and a debonding agent.

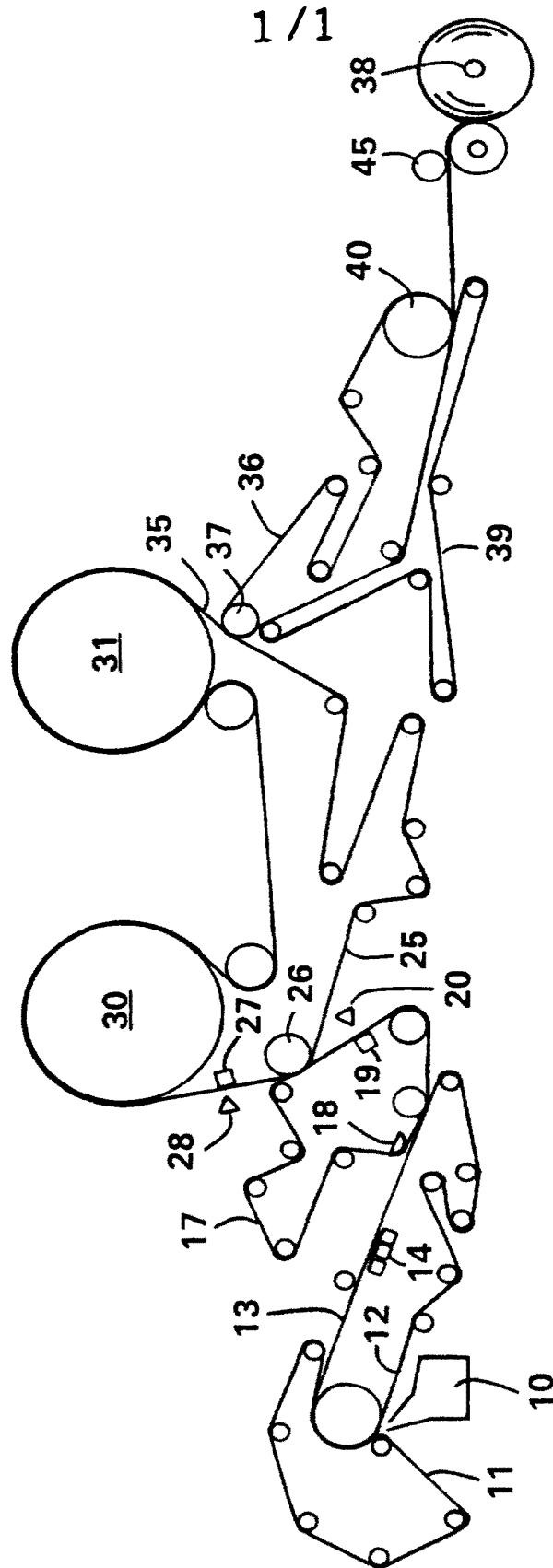


FIG.1

INTERNATIONAL SEARCH REPORT

International Application No
PC1/US 95/09232A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 D21F11/14 D21F11/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 D21F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP,A,0 029 269 (THE PROCTOR & GAMBLE COMPANY) 27 May 1981 see the whole document ---	1-5,7,8, 10-12, 14,16-20
Y	AU,A,451 483 (KIMBERLY CLARK CORPORATION) 9 March 1972 see the whole document ---	1-5,7,8, 10-12, 14,16-20
A	US,A,3 994 771 (MORGAN ET AL) 30 November 1976 see the whole document ---	1,2,7,8, 14,16, 18-20
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Date of the actual completion of the international search

21 November 1995

Date of mailing of the international search report

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International Application No
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APPLICATION #
18/131,383

RECEIPT DATE / TIME
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Title of Invention

Soft Sanitary Tissue Products Comprising Non-wood Fibers

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 7685

FILED BY Gaurav Kumar

PATENT CENTER # 63591483

FILING DATE 04/06/2023

CUSTOMER # 27752

FIRST NAMED INVENTOR Christopher Michael YOUNG

CORRESPONDENCE ADDRESS -

AUTHORIZED BY Richard Alexander

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NPL_2_16255M4_Search_Report_for_PCT_US2023_017659.pdf

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NPL_4_Pulp_and_Paper_from_Blue_Agave.pdf

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NPL_7_Fermentative-Chemical_and_Mechanical.pdf

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NPL_6_Economic_Research_Services.pdf

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NPL_12_Nonwood_Plant_Fiber_Characteristics.pdf

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NPL_11_Fiber_Morphology_and_New_Crops.pdf

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NPL_15_Effect_of_Beating_Revolution.pdf

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NPL_14_A_Study_of_the_Physical_and_Mechanical_Properties

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NPL_18_Brazilian_Lignocellulosic_Wastes_for_Bioenergy.pdf	6D751A2A2989C1C8D66C46A6E12AFAB9F7FA0A998E5B6B4D2545542D22FC310E3732E6D00CD326E142280CF33810B9CEA0200CC32C49A9A90331994AE4E8AA1D
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PL_9_Fundamentals_of_Pape
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(a)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/OC/E/O/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the international filing date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.