



United States Patent
Turner

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MANUFACTURING and COMPOSITION
METHOD for a COCONUT-BASED PAPER
PRODUCT ALTERNATIVE

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ABSTRACT

A material composition and manufacturing process wherein coconut palm tree by-products are utilized to create a wood-based paper product alternative: such as a substitute for wood-based cardboard typically used in boxes and product packaging. The manufacturing process blends coconut-products and a cellulose bonding agent into a homogenous pulp mixture which is then densified via pressure to a certain thickness, depending on its purpose, cured using dry heat, and extruded into a compressed pallet-like form. The aforementioned material can then be manipulated into/for different uses, products, and shapes.

References Cited

U.S. PATENT DOCUMENTS

US5728266A	12/1992	Deslierres et al.
US1181553A	03/1912	Taylor et al.
US1865649A	06/1931	Max

FIGURE 1

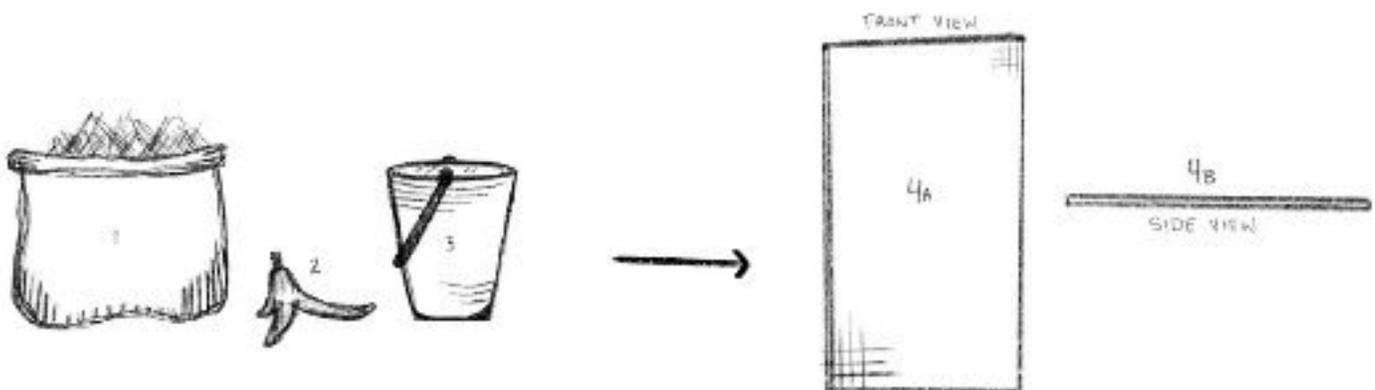


FIGURE 2

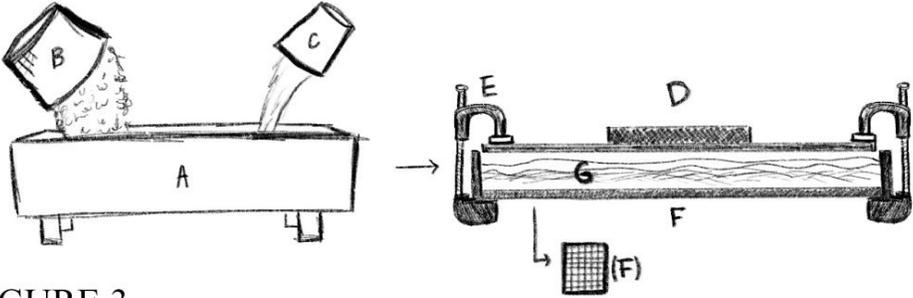


FIGURE 3

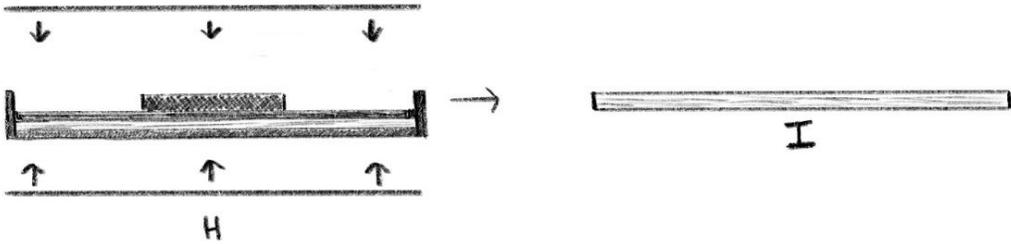
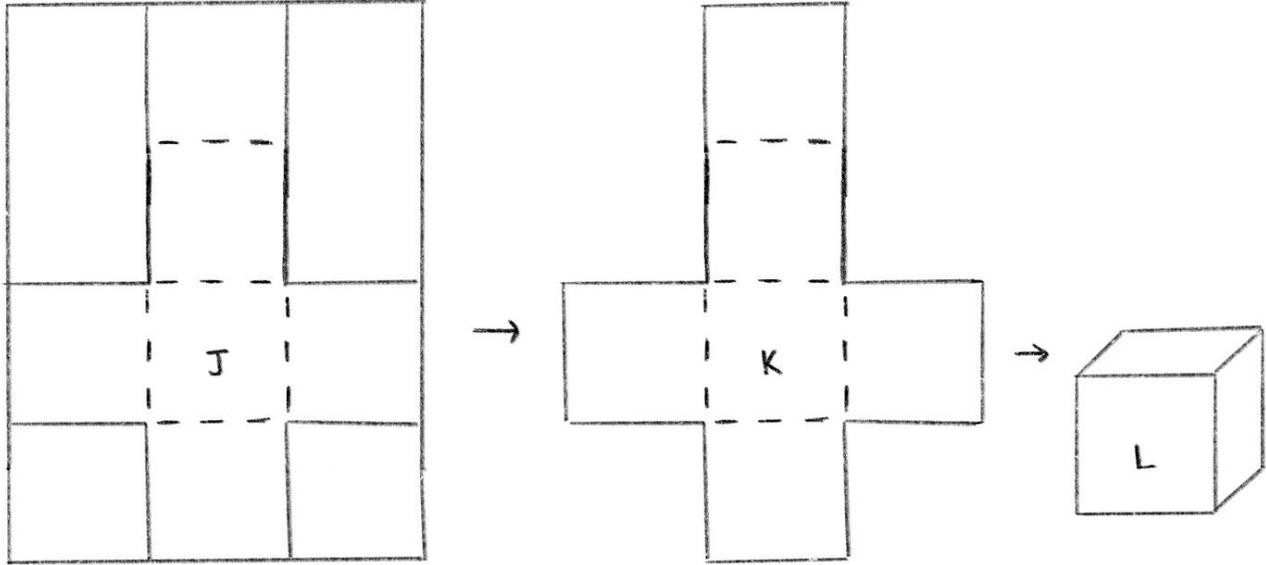


FIGURE 4



FIELD OF THE INVENTION

This invention relates to the manufacturing, formation, and formulation of paper-like materials. Specifically, paper-like materials intended to be used as a substitute for existing paper products such as straws, cups, cardboard boxes, and other packaging materials.

BACKGROUND OF THE INVENTION

Through a process of creating a plant-based (tree) cellulose pulp mixture, compressing the pulp into a sheet-like form, and curing the pulp with a combination of heat and chemicals, paper and other paper-products like cardboard are created.

The use of tree cellulose in the creation of paper directly contributes to the rising global climate change, as wood products account for 10% of deforestation globally.

Coconuts are a by-product of coconut palm trees that do not contribute directly to deforestation. Coconut coir and coconut pulp do not require the trees' trunk to be severed or the tree to be injured beyond viability.

Coconut coir is a fibre acquired from the outer level of coconut's husk and has a mulch-like consistency. Coconut shell powder is acquired by pulverizing the hard, outer shell of a coconut into a flour-like consistency. It is known that coconut coir has the capability of acting as a bonding agent which supplements the proceeding descriptions.

OBJECTS OF THE INVENTION

It is thus an object of the invention to provide a new method through which a new paper product is formulated from coconut by-products.

A secondary object of the invention is to produce a more eco-friendly and renewable paper product from coconuts, compared to standard wood-based paper products.

An additional object of the invention is that the aforementioned coconut-based paper product is capable of being manipulated in ways equivalent to or better than wood-based paper products.

An additional object of the invention is that the coconut-based paper product is able to achieve various thicknesses and surface areas.

A final object of the invention is the creation of a new method wherein a coconut-based paper

product alternative is formulated and manufactured as a better substitute for wood-based paper products.

SUMMARY OF THE INVENTION

The inventive method described above aims to make obsolete the use of tree-based paper products or the need to use trees within the production process of paper products, beyond tree by-products. This is done so by exchanging wood for coconut materials, a by-product of the coconut palm tree.

In accordance with the present method of creating paper-products, there are two innovative methods posed: utilizing banana peels within the bonding agent of the pulp and substituting both coconut coir AND coconut shell powder for wood-based materials.

BRIEF DESCRIPTION OF THE DRAWING

Figure 1 represents the different materials used in the manufacturing process of the invention and the form of the final product itself.

Figure 2 demonstrates the blending process of both dry and wet substances in making the coconut pulp product, and how the pulp is manipulated into a compressed form.

Figure 3 depicts the curing process of the pulp in dry heat and the resulting flattened paper-like product.

Figure 4 shows how the paper-like product can be manipulated into shapes such as a box which could be used in packaging goods and/or shipping.

SPECIFIC DESCRIPTION

The bag shown in **Figure 1** [1] represents the coconut shell powder and coir that creates the dry blended portion of the pulp mixture. [2] Is representative of the banana peel cellulose that is blended with water [3] to create a light bonding agent. The post-curing/processing form of the pulp, that has been compressed and heated is shown in [4A] as a front view and [4B] as a side-view.

The process shown in **Figure 2** demonstrates the blending of both the [B] dry coconut products and the [C] cellulose bonding agent. [A] is a visualization of the trough wherein both [B] and [C] are combined and mixed to a homogeneous state.

The pulp mixture [G] within [A] is then transferred into [F], a forming tray with a dense metal webbing [F] on its base to drain excess moisture during compression and heating. A weighted top [D] is then added to the tray, and industrial clamps [E] are tightened on either end to compress the pulp into the tray's form.

The curing process is represented by **Figure 3**, in which [H], representative of a dry heat oven, slowly cures [G] of **Figure 2** which remains within the tray [F] with the weighted top [D]. After curing, a dense pallet/sheet [I] has become of the pulp [G].

Figure 4 shows how this coconut-based paper product [I] can mimic the transformations of wood-based cardboard. This is only 1 of many possible transformations of [I]. This specifically shows how [I] can be bent along the dotted-lines and cut along the solid lines to form the standard template for a box [K]. That template can then be made into a box [L] by utilizing tape to match each edge with its neighbor.

What is claimed is:

1. A method for composing a coconut-based paper substitute, comprising:
 - a. A dry blend of coconut coir and coconut shell powder mixed together until they are close-to homogeneous.
 - b. A pulp that is made by mixing together the dry blend and a cellulose bonding agent of banana peel slurry and water.
 - c. A process where the aforementioned pulp is compressed into a form via pressure during which the excess liquid is drained from the pulp.
 - d. A process wherein the aforementioned pulp is cured while under physical pressure.
2. The method for composing a coconut-based paper substitute of claim 1, wherein the dry blend is composed of approximately 75% coconut shell powder and 25% coconut coir.
3. The method for composing a coconut-based paper substitute of claim 1, wherein the bonding agent is composed of approximately 70% water and 30% banana peel slurry
4. The method for composing a coconut-based paper substitute of claim 1, wherein the

bonding agent has a viscosity level between 150 to 200 centipoise (cps).

5. The method for composing a coconut-based paper substitute of claim 1, wherein the pulp is describable as a putty-like form of dry and wet ingredients mixed together.
6. The method for composing a coconut-based paper substitute of claim 1, wherein the pulp forms a near-homogeneous mixture with viscosity level 1,000 to 3,000 centipoise (cps).
7. The method for composing a coconut-based paper substitute of claim 1, wherein the pulp is compressed via a physical form of pressure using top-heavy weight and industrial clamps.
8. The method for composing a coconut-based paper substitute of claim 1, wherein the pulp is compressed via a high PSI chamber that uses pressure to compress the pulp.
9. The method for composing a coconut-based paper substitute of claim 1, wherein the pulp is compressed via both methods explained in claim 7 and claim 8.
10. The method for composing a coconut-based paper substitute of claim 1, wherein the banana peel used in the bonding agent.
11. The method for composing a coconut-based paper substitute of claim 1, wherein the pulp mixture is composed of approximately 50% dry blend and approximately 50% bonding agent.