

## SPECIFICATION

### **COMPOSITION FOR COGON GRASS (*Imperata cylindrica*) PAPER**

#### **TECHNICAL FIELD**

The present utility model generally relates to paper, but more particularly to a process of producing cogon grass (*Imperata cylindrica*) paper and which can be used as a raw material for commercial application in functional lamp manufacturing.

#### **BACKGROUND OF THE UTILITY MODEL**

Disclosed in publication numbers PH22019000189 and PH22019000192 (Bate, et al) relates “A Process and Composition of Producing Handmade Cogon Grass (*Imperata Cylindrica*) Paper” details a method that combines cogon grass and recycled paper with sodium hydroxide to create handmade cogon grass paper. However, the prior art employs the process of drying using a drying pan or microwave oven to ensure thorough drying of the final product, but in most cases, the paper is not uniformly dried using a pan or microwave. In addition, the composition includes used paper as a component that affects the 100% quality of the cogon grass paper.

In another Philippine patent, PH22017000707 entitled “A Process of Making Water Hyacinth (*Eichornia Crassipes*) and Cogon Grass (*Imperata Cylindrica*) as Paper Product” published in December 2017, the invention discussed the production of paper using a combination of two different types of grass: water hyacinth (*Eichornia crassipes*) and cogon grass (*Imperata Cylindrica*). However, the said prior art did not state if it

incorporated the use of a blender to achieve a finer pulp consistency and texture.

The invasive weed known as cogon grass, or *Imperata cylindrica*, is able to reach two to four feet along highway medians and open pastures. In the Philippines, it is referred to as "talahib" and is simple to recognize due to the quick development of its long leaves. Additionally, Van Loan et al. (2018) stated that this grass is considered one of the worst invasive species in the world because of its aggressive behavior.

Cogon grass is also reported to steal nutrients from other plants in the area, which results in poor growth and delayed harvest if not removed immediately. Multiple methods have been tested to remove cogon grass, such as mowing, but these are seen as ineffective since they only remove the grass above ground and not its roots. This has led people to try other harmful methods, such as burning the grass and using a combination of herbicides like glyphosate and imazapyr to mitigate the growth of cogon grass through continuous application (Minogue et al., 2018).

Despite its invasiveness, cogon grass is recognized for its strong, durable fibers that are ideal for crafting a variety of paper-like products. Kassim et al. (2015) stated that with the increasing demand for wood fiber consumption, cogon grass presents a great alternative raw material for paper-based products. By incorporating cogon grass paper into sustainable products such as lamps, keychains, or paper bags, this invasive weed is prevented from further damaging the environment. What was once perceived as a useless and troublesome crop has now been innovatively repurposed into eco-friendly products.

## **SUMMARY OF THE UTILITY MODEL**

It is the primary object of the present utility model is to provide a cogon grass paper that employs the process of sun-drying on breathable cloth substrates combined with vertical suspension to achieve uniform  
5 moisture removal and energy conservation in cogon grass paper production. Additionally, the present utility model incorporates a chlorine-based treatment (sodium hypochlorite) to lighten the cogon grass's dark green pigment, followed by fast-dye application to have a greater variety of paper colors.

10 Another object of the present utility model is to provide a process for producing paper from cogon grass (*Imperata cylindrica*) that the quality of the paper is 100% made of cogon grass.

Still, an object of the present utility model is to provide a process for producing paper from cogon grass (*Imperata cylindrica*) that results in a  
15 finer pulp texture with the use of a blender.

Yet an object of the present utility model is to provide a process for producing paper from cogon grass (*Imperata cylindrica*) that is very easy, employing a combination of novel and conventional steps that will ensure production of good quality paper.

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## **DETAILED DESCRIPTION**

The cogon grass paper is produced through boiling water and adding 80.15% of cogon grass as the main raw material, 6.11% of caustic soda, 12.72% of chlorine to lighten the pulp, and 1.02% fast-dye to color the  
25 pulp. The quality of the paper is 100% made of cogon grass.

The process of producing handmade cogon grass paper starts after the harvested mature cogon grass is dried under the sun. After the cogon grass dried, it was cut into smaller pieces using a pair of scissors. The next step is to boil 1 liter of water in a casserole until it reaches 150°C. The cogon grass is then added to the boiling water along with 24 grams of caustic soda flakes. The mixture is simmered and stirred continuously for three hours.

After boiling, the cogon grass is strained and rinsed with fresh water to remove its slimy texture. The rinsed cogon grass is then blended to create a fine pulp. The pulp is bleached in a large container and left to sit for 15 minutes. Once the pulp lightens in color, it is rinsed three times to remove excess chlorine. The pulp is then boiled again in a casserole with water and fast-dye to add color such as pink, yellow, green, and blue. After the pulp absorbs the dye, it is strained and rinsed with fresh water to remove any excess dye.

Next, the colored cogon grass pulp is molded using a silk screen placed over a large basin. Excess water is removed from the molded pulp with a sponge to ensure it adheres firmly to a clean cloth. The rectangular silk screen was pressed with a sponge to remove additional water before its lifted to separate the molded cogon grass paper.

The cloth holding the molded paper was then hung on a wire to dry in the sun. Finally, once the paper was completely dry, it is carefully removed from the cloth. The steps of sun-drying on breathable cloth substrates combined with vertical suspension to achieve uniform moisture removal and energy conservation in cogon grass paper production.

Additionally, the present utility model incorporates a chlorine-based treatment (sodium hypochlorite) to lighten the cogon grass's dark green

pigment, followed by fast-dye application to have a greater variety of paper colors.

A process of preparing handmade cogon grass paper comprising the steps of:

- 5 a. boiling clean cut cogon grass with water mixed with 24 grams of caustic soda flakes for 3 hours until mushy texture is obtained;
- b. straining the boiled cogon grass to separate the mushy-textured cogon grass;
- c. rinsing the mushy textured cogon grass with fresh water to remove  
10 the slimy texture;
- d. blending the rinsed cogon grass in a blender until becomes pulp;
- e. bleaching the cogon grass pulp with chlorine for 15 minutes;
- f. rinsing the bleached cogon grass pulp with fresh water to remove excess chlorine;
- 15 g. boiling the rinsed cogon grass pulp with 1 liter of water and 4 grams of fast-dye to add color;
- h. rinsing the dyed cogon grass pulp with fresh water to remove excess fast-dye;
- i. molding the colored cogon grass pulp with water using a mold and  
20 deckle set, and drain;
- j. placing and press the molded colored cogon grass pulp firmly on a clean cloth to remove excess water;
- k. sun-drying the molded cogon grass; and
- l. removing the dried cogon grass paper from the cloth.

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