



US007943009B2

(12) **United States Patent**
van Heiningen et al.

(10) **Patent No.:** **US 7,943,009 B2**
(45) **Date of Patent:** **May 17, 2011**

(54) **PROCESS OF TREATING A LIGNOCELLULOSIC MATERIAL WITH AN ALKALI METAL BORATE PRE-EXTRACTION STEP**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **12/649,614**

(22) Filed: **Dec. 30, 2009**

(65) **Prior Publication Data**
US 2010/0101742 A1 Apr. 29, 2010

Related U.S. Application Data

(63) Continuation of application No. 11/640,820, filed on Dec. 18, 2006, now Pat. No. 7,824,521.

(51) **Int. Cl.**
D21C 3/22 (2006.01)
D21C 3/02 (2006.01)

(52) **U.S. Cl.** **162/43; 162/17; 162/41; 162/70**
(58) **Field of Classification Search** **162/9, 17, 162/43**

See application file for complete search history.

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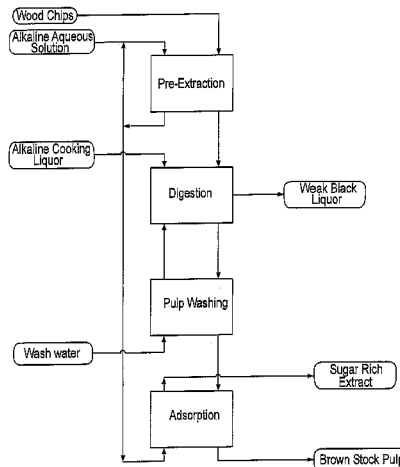
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(57) **ABSTRACT**

A process of treating a lignocellulosic material includes a pre-extraction step in which hemicellulose is extracted from the lignocellulosic material. In one embodiment, the pre-extraction step involves contacting the lignocellulosic material with an aqueous solution under conditions that release acidic material from the lignocellulosic material into the aqueous solution, and the aqueous solution includes a basic material that at least partly neutralizes the acidic material so that the aqueous solution at the end of the pre-extraction step has a pH within a range of from 4.5 to 11. The process also includes a pulping step, after the pre-extraction step, in which the lignocellulosic material is separated into pulp. The process further includes an adsorption step, after the pulping step, in which hemicellulose is adsorbed on the pulp.

14 Claims, 11 Drawing Sheets



Pre-Extraction/Alkaline Cooking/Adsorption Block Diagram