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(12) **United States Patent**  
**Waite et al.**

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(54) **SYSTEM AND METHOD FOR  
CONDITIONING A HARDWOOD PULP  
LIQUID HYDROLYSATE**

204/627; 162/29-46, 239; 435/262,  
435/267, 271, 274, 275, 276, 277

See application file for complete search history.

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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 83 days.

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(65) **Prior Publication Data**

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**Related U.S. Application Data**

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(57) **ABSTRACT**

A system and method for hardwood pulp liquid hydrolysate  
conditioning includes a first evaporator receives a hardwood  
mix extract and outputting a quantity of vapor and extract. A  
hydrolysis unit receives the extract, hydrolyzes and outputs to  
a lignin separation device, which separates and recovers a  
quantity of lignin. A neutralization device receives extract  
from the lignin separation device and a neutralizing agent,  
producing a mixture of solid precipitate and a fifth extract.  
The solid precipitate is removed from the fifth extract. A  
second evaporator removes a quantity of acid from the fifth  
extract in a vapor form. This vapor may be recycled to  
improve total acid recovery or discarded. A desalination  
device receives the diluted extract, separates out some of the  
acid and salt and outputs a desalinated solution.

(51) **Int. Cl.**

**B01D 61/58** (2006.01)

**B01D 61/42** (2006.01)

(52) **U.S. Cl.**

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204/627; 127/36; 127/37; 127/55; 127/46.1

(58) **Field of Classification Search**

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**19 Claims, 3 Drawing Sheets**

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