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(54) **Title:** METHODS AND APPARATUS FOR HYDROLYZING CELLULOSIC MATERIAL

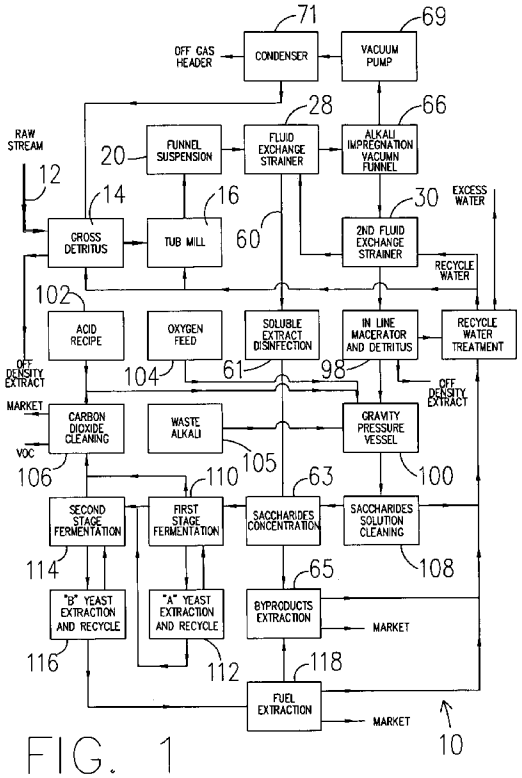

FIG. 1

(57) **Abstract:** A method of hydrolyzing woody cellulosic material containing lignin and air pockets involves impregnating the woody cellulosic material a first alkali having a pH of from 10 to 14 such that the first alkali is in contact with the lignin within the woody cellulosic material. Thereafter, the woody cellulosic material is advanced through a gravity pressure vessel for the acid hydrolysis conversion of cellulosic material to sugars. In accordance with other methods, ultrasound may be introduced during impregnation or at the gravity pressure vessel or both.

WO 2009/058204 A1