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Water Assisted Pressure Control for Liquid Hot Water Pretreatment System

A controlled pressure heat exchange system uses water and cellulosic biomass slurry to create a more desirable pretreatment process for cost-effective biofuel ethanol production.

Researchers at Purdue University have developed a method whereby the slurry of corn stover is mixed with water to create a system that obtains equal pressure throughout the system. A concentrated solution of corn stover and cellulosic biomass are added into the outer layer of a tube in tube heat exchange, and then water is added through small lines spaced at intervals throughout the treatment. Together with a back pressure valve, the pressure of the tubes can be controlled at pressures exceeding 200 psi. This helps avoid localized flashing, which is undesirable in the pretreatment process, as well as obtaining the equal pressure throughout the system. This would create a more desirable pretreatment process for the production of ethanol from biofuel than what currently exists, and is described in U.S. Patent #5,846,787

Advantages:

-Inexpensive

-Simple

-Environmentally friendly

Potential Applications:

-Production of biofuel

TRL: 4

Intellectual Property:

Provisional-Patent, 2008-06-26, United States | NATL-Patent, 2009-06-26, Canada | PCT-Patent, 2009-06-26, WO | Utility Patent, 2010-12-23, United

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GreenTech/Circular Economy & Waste Reduction
Energy & Power Systems/Power Generation

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Keywords: Corn stover slurry, cellulosic biomass, tube in tube heat exchange, back pressure valve, equal pressure system, localized flashing avoidance, ethanol production, biofuel pretreatment process, patent 5846787, inexpensive pretreatment, Biofuels, Cellular Hydrolysis, Green Technology, Materials and Manufacturing