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[54] **PROCESS FOR RECOVERING HYDROCARBONS FROM HYDROCARBON-CONTAINING BIOMASS**

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[58] **Field of Search** 435/99, 105, 166–171, 435/262, 267, 271, 276, 813, 819; 426/7, 49, 50, 52

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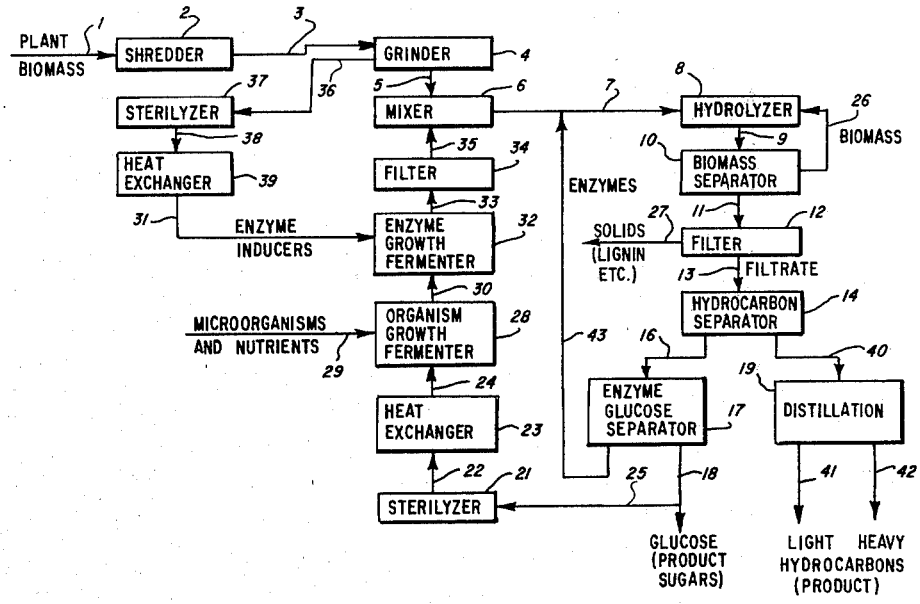
[57] **ABSTRACT**

A process for enzymatically converting whole plant biomass containing hydrocarbon-containing laticifers to soluble sugars and recovering hydrocarbons in increased yields which comprises hydrolyzing whole plant cellulosic material in the presence of enzymes, particularly cellulase, hemicellulase, and pectinase, to produce a hydrocarbon product and recovering from the hydrolysis products a major proportion of the cellulase, hemicellulase and pectinase enzymes for reuse. At least some portion of the required make-up of cellulase, hemicellulase and pectinase enzymes is produced in a two-stage operation wherein, in the first stage, a portion of the output sugar solution is used to grow enzyme secreting microorganisms selected from the group consisting of cellulase-secreting microorganisms, hemicellulase-secreting microorganisms, pectinase-secreting microorganisms, and mixtures thereof, and in the second stage, cellulase, hemicellulase and pectinase enzyme formation is induced in the microorganism-containing culture medium by the addition of an appropriate inducer such as biomass. The cellulase, hemicellulase and pectinase enzymes are then recycled for use in the hydrolysis reaction.

5 Claims, 1 Drawing Figure