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[54] **SUPERCRITICAL FLUIDS AS DILUENTS IN COMBUSTION OF LIQUID FUELS AND WASTE MATERIALS**

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[58] Field of Search **431/2; 110/347, 238, 110/346; 239/5**

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[57] **ABSTRACT**

The present invention is directed to processes and apparatus in which supercritical fluids are used as viscosity reduction diluents for liquid fuels or waste materials which are then spray atomized into a combustion chamber. The addition of supercritical fluid to the liquid fuel and/or waste material allows viscous petroleum fractions and other liquids such as viscous waste materials that are too viscous to be atomized (or to be atomized well) to now be atomized by this invention by achieving viscosity reduction and allowing the fuel to produce a combustible spray and improved combustion efficiency. Moreover, the present invention also allows liquid fuels that have suitable viscosities to be better utilized as a fuel by achieving further viscosity reduction that improves atomization still further by reducing droplet size which enhances evaporation of the fuel from the droplets.

19 Claims, 9 Drawing Sheets

