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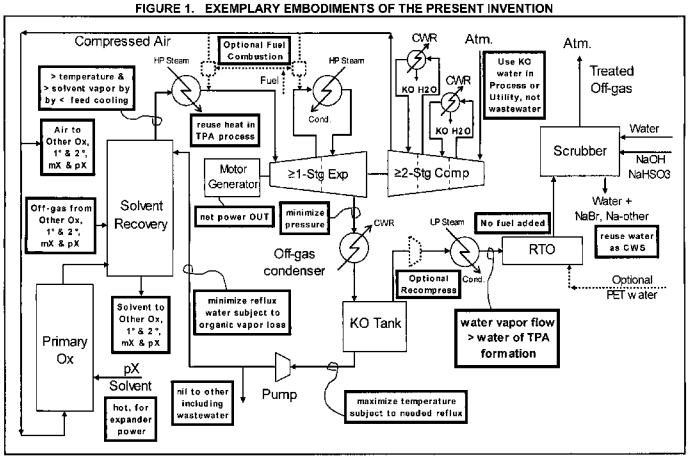
[Continued on next page]

(54) Title: DICARBOXYLIC ACID PRODUCTION WITH SELF-FUEL OXIDATIVE DESTRUCTION

FIGURE 1. EXEMPLARY EMBODIMENTS OF THE PRESENT INVENTION



(57) Abstract: The invention provides improved energy content in and shaft power recovery from off-gas from xylene oxidation reactions while at the same time minimizing wastewater treatment cost. More shaft power is produced using off-gas than is required to drive the main air compressor, even with preferred, relatively low oxidation temperatures. Simultaneously, an amount of wastewater greater than byproduct water from oxidation of xylene is kept in vapor form and treated along with off-gas pollutants in a self-sustaining (self-fueling) gas-phase thermal oxidative destruction unit. Optionally, off-gas is combined from multiple xylene oxidation reactors, comprising primary and/or secondary oxidation reactors and forming TPA and/or IPA. Optionally, air compressor condensate and caustic scrubber blowdown are used in a TPA process or as utility water, effectively eliminating normal flow of liquid wastewater effluent from a TPA plant. Optionally, PET off-gas containing the water of PET formation is treated in a shared thermal oxidative destruction unit, effectively eliminating normal flow of liquid wastewater effluent from a combined pX-to-TPA-to-PET plant.

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