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(54) **Title:** ADIABATIC OLEFIN PRODUCTION

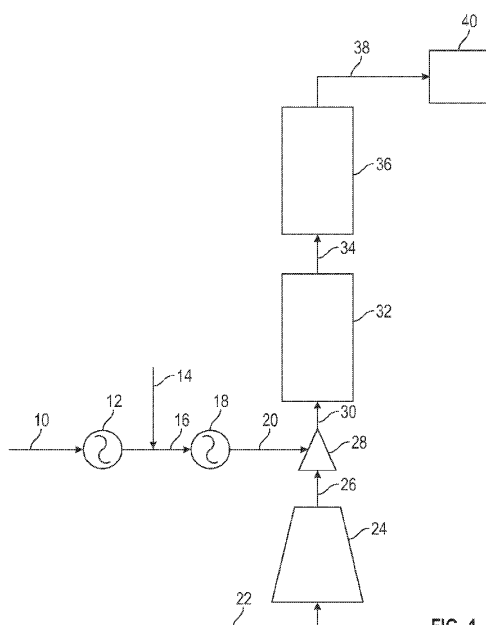


FIG. 4

(57) **Abstract:** Systems and processes for cracking hydrocarbons to produce olefins herein includes heating a hydrocarbon feedstock or a mixture comprising steam and hydrocarbons to a first temperature to form a preheated feed, and also include heating steam to a second, higher, temperature in a turbomachine to form a superheated reaction steam. The preheated feed is then mixed with the superheated reaction steam to form a reaction mixture at a cracking temperature, thereby cracking the hydrocarbons to form olefins, producing a reaction effluent. The reaction effluent is then quenched and separated effluent to recover the olefins.

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