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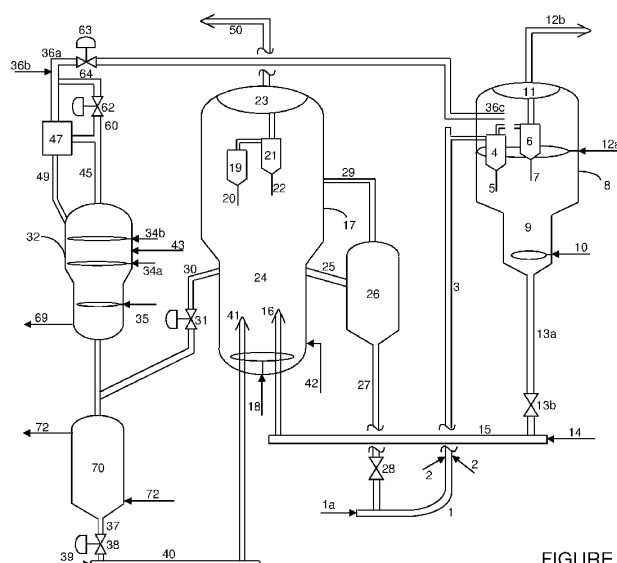


FIGURE 1

(57) Abstract: Apparatus and processes herein provide for converting hydrocarbon feeds to light olefins and other hydrocarbons. The processes and apparatus include a conventional riser reactor in combination with a mixed flow (e.g., including both counter-current and co-current catalyst flows) fluidized bed reactor designed for maximizing light olefins production. The effluents from the riser reactor and mixed flow reactor are processed in a catalyst disengagement vessel, and the catalysts used in each reactor may be regenerated in a common catalyst regeneration vessel. Further, integration of the two-reactor scheme with a catalyst cooler provides a refinery the flexibility of switching the operation between the two -reactor flow scheme, a catalyst cooler only flow scheme, or using both simultaneously.

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