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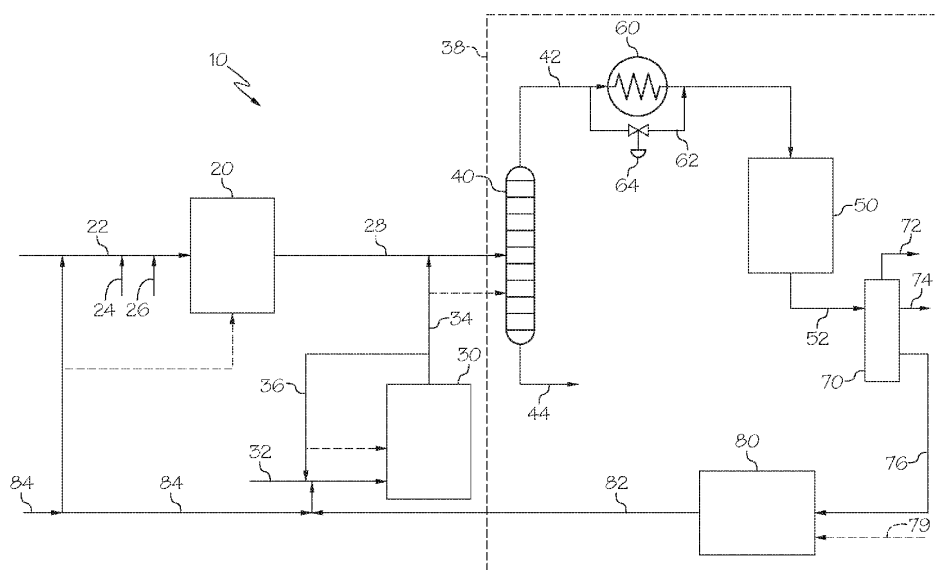


FIG. 1

(57) **Abstract:** A method for operating an integrated system for producing olefins may include contacting a hydrogenation feed with a first hydrogenation catalyst to produce a hydrogenated effluent, the hydrogenation feed including at least a portion of a first process effluent from a first olefin production process and at least a portion of a second process effluent from a second olefin production process. The hydrogenation feed may include at least hydrogen, ethylene, carbon monoxide, acetylene, methyl acetylene, and propadiene, and the first hydrogenation catalyst may be a hydrogenation catalyst having a temperature operating range of at least 40°C. The hydrogenated effluent may include methyl acetylene, propadiene, or both. The method may further include contacting at least a portion of the hydrogenated effluent with a second hydrogenation catalyst, which may cause hydrogenation of at least a portion of the methyl acetylene and propadiene to produce an MAPD hydrogenated effluent.

[Continued on next page]

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