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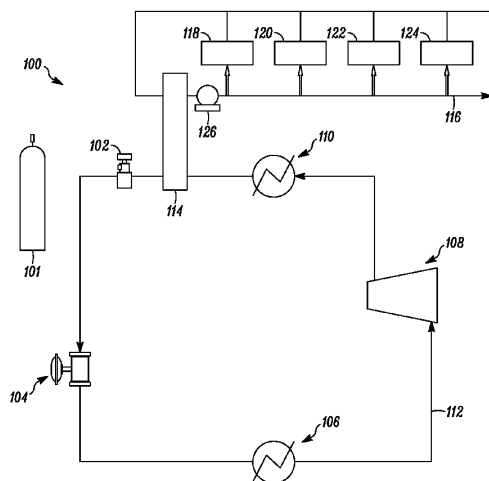


FIG. 1

(57) Abstract: In an embodiment, a method of producing a fluoroolefin comprises coupling 3,3-dichloro-1,1,1,2,2-pentafluoropropane ($\text{CF}_3\text{-CF}_2\text{-CHCl}_2$) in a liquid phase in the presence of a catalyst to form a composition comprising 1,1,1,2,2,5,5,6,6,6-decafluoro-3-hexene ($\text{CF}_3\text{CF}_2\text{CH=CHCF}_2\text{CF}_3$). In another embodiment, a method of producing a fluoroolefin comprises coupling 1,1,1-trichloropentafluoropropane ($\text{CF}_3\text{-CF}_2\text{-CCl}_3$) in a vapor phase in the presence of a first catalyst to form a composition comprising 3,4-dichloro-1,1,1,2,2,5,5,6,6,6-decafluoro-3-hexene ($\text{CF}_3\text{-CF}_2\text{-CCl=CCl-CF}_2\text{-CF}_3$). The method may further include forming the $\text{CF}_3\text{-CF}_2\text{-CCl}_3$ in a vapor phase from $\text{CF}_3\text{CF}_2\text{CH}_m\text{Cl}_{3-m}$ and chlorine (Cl_2). The method may further include hydrodechlorinating the 3,4-dichloro-1,1,1,2,2,5,5,6,6,6-decafluoro-3-hexene with hydrogen (H_2) in a vapor phase in the presence of a second catalyst to form a composition comprising $\text{CF}_3\text{CF}_2\text{CH=CHCF}_2\text{CF}_3$ and 3-chloro-1,1,1,2,2,5,5,6,6,6-decafluoro-3-hexene ($\text{CF}_3\text{CF}_2\text{CCl=CHCF}_2\text{CF}_3$).

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