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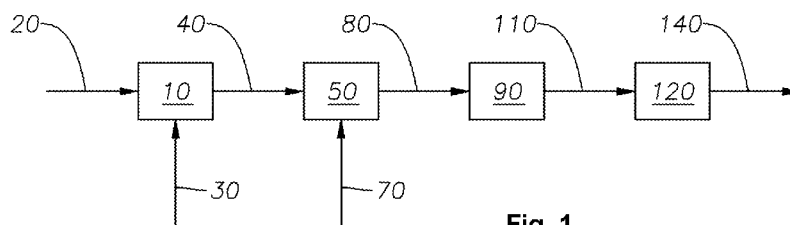
(54) Title: CONVERSION OF CO-FED METHANE AND LOW HYDROGEN CONTENT HYDROCARBON FEEDSTOCKS
TO ACETYLENE

Fig. 1

(57) Abstract: A process and apparatus are provided to produce acetylene from a feed stream of low hydrogen content hydrocarbons such as coal by: (a) blending the hydrocarbons with methane to provide a blended mixture containing at least about 12.5 wt % atomic hydrogen; (b) partially combusting the blended mixture in a reactor in the presence of a source of oxygen to provide a partially combusted mixture at or above a temperature sufficient to produce methyl radicals; (c) maintaining the partially combusted mixture at or above the temperature for a residence time sufficient to produce a product stream containing enhanced yields of acetylene without significant formation of coke or coke precursors; (d) cooling the product stream to reduce the temperature of the product stream within a time sufficiently brief to substantially arrest any cracking reactions and provide a cooled product stream; and (e) recovering acetylene from the cooled product stream. The acetylene can be converted to ethylene by a conventional hydrogenation process.