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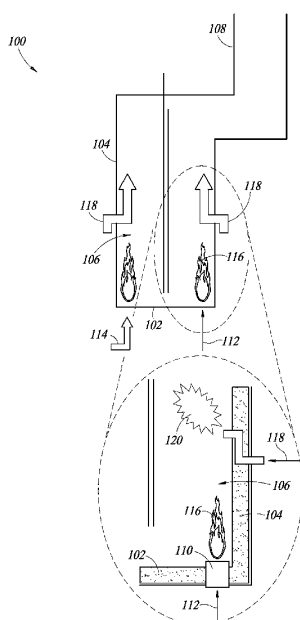
(54) **Title:** HEATER WITH REMOTE COMBUSTION AIR ADDITION

FIG. 2

(57) Abstract: A heater includes a radiant section with a bottom wall and a side wall. A burner is provided on the bottom wall and a primary fuel stream and a primary combustion air stream are provided through the burner to support a primary combustion reaction local to the burner. The primary combustion air stream may be less than the air needed to burn all of the primary fuel stream, resulting in the primary combustion reaction being sub-stoichiometric and reducing NOx formation. A remote air pipe injects remote air into the radiant section distal to the burner, and in some cases, spaced from the burner by at least two meters. The remote air addition supports a lean secondary combustion reaction that further minimizes NOx emissions concentration. The heater is suitable for use with high H2 fuel or preheated air, or both, to lower CO2 emissions while meeting NOx emission targets.

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