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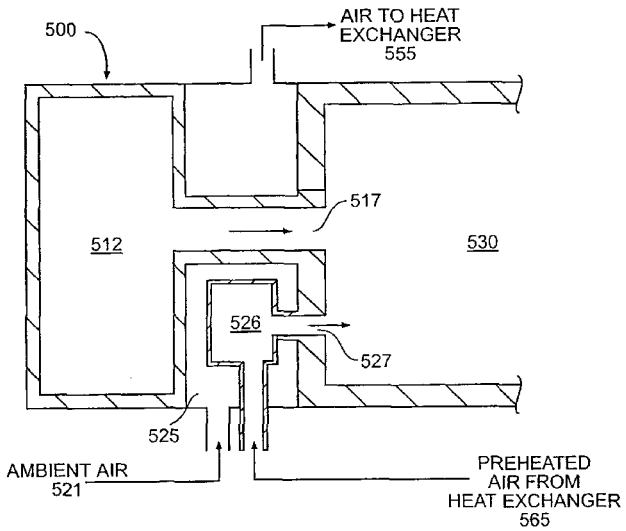
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(54) Title: SUPERATMOSPHERIC COMBUSTOR FOR COMBUSTING LEAN CONCENTRATIONS OF A BURNABLE GAS



(57) Abstract: A superatmospheric combustion apparatus and a method of operating such an apparatus include providing a superatmospheric combustion device (400) having a lean gas chamber (412), a combustor (430), a heat recovery section (440) and an exhaust (450), feeding lean gas to the lean gas chamber, providing a heat sink/pressure equalization chamber (425) and a preheated air chamber (526) within the combustion device, feeding pressurized ambient air to the heat sink/pressure equalization chamber, feeding preheated air to the preheated air chamber, exchanging heat from the lean gas chamber, the preheated air chamber, and the combustor to the pressurized ambient air in the heat sink/pressure equalization chamber, feeding the lean gas from the lean gas chamber to the combustor, feeding the preheated air from the preheated air chamber to the combustor, and combusting the lean gas and the preheated air in the combustor at superatmospheric pressure.

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