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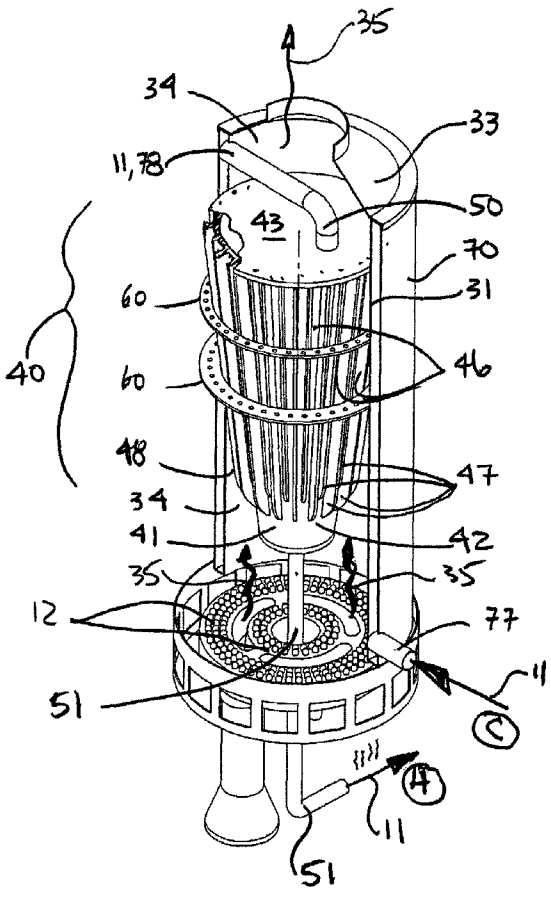
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(54) Title: HEATING SYSTEM FOR LIQUIDS



(57) Abstract: A heater comprises an enhanced-surface area heat transfer vessel which is situated co-axially in a hot flue gas plenum. The plenum is formed by dual-wall heating jacket. Liquid flowing through the jacket is heated co-currently by the flue gas before the preheated liquid is conducted to the top of the vessel for countercurrent heat exchange therein before discharge from the bottom of the vessel. Hot flue gas flowing through the plenum is directed circumferentially by one or more spaced and perforated ring plates placed across the plenum annulus between the jacket and the vessel. Aluminum construction of the vessel and jacket with protective coatings contribute to a lightweight heater for either floor or even wall mounting. The heater is conveniently implemented in a hydronic heating system, a potable hot water system or a combination of both.

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