

then fed into a dissolving tank containing an aqueous solution to form a green liquor. The green liquor, after clarification, is treated with lime to form a white liquor containing the regenerated pulping chemicals. Waste steam is an especially preferred fluidizing gas for use in the fluidized bed reactor. This process provides improved energy recovery and process productivity, reduction in gaseous sulfur-containing emissions, reduction in landfilled wastes, and improved safety as compared to a conventional kraft smelt treatment process.

**5546760**

### **GENERATOR FOR ABSORPTION HEAT PUMPS**

Cook F Bert; Petty Stephen E; Meacham Howard C; Christensen Richard N; McGahey Kevin R  
Columbus, OH, UNITED STATES assigned to  
Columbia Gas of Ohio Inc

An absorption refrigeration and heating system has helical concentric coils for two generators and recuperators) on a common axis with a heating unit at the center and allowing the hot combustion gases to circulate in serpentine fashion through separate concentric chambers containing the coils. An absorber, condenser and recuperator are placed in a single module and configured with a tube-in-tube or tube-in-cylinder construction with fluted inner tubes. A general purpose, divided-flow, tube-in-cylinder, heat-transfer device is used to reduce the pressure drop in the circulating fluid.

**5546766**

### **AIR SEPARATION**

Higginbotham Paul Guildford, UNITED  
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Air is compressed in a compressor, purified in a purification unit, cooled by passage through a main heat exchanger and separated in a double rectification column comprising a higher pressure rectification column and a lower pressure rectification column. A stream of argon-enriched oxygen vapour is withdrawn from the lower pressure rectification column through an outlet and an argon product is separated from it in an argon rectification column provided with an argon condenser. Argon is condensed in the condenser by indirect heat exchange with a second stream of air at a pressure between the operating pressures of the columns. The second air stream is partially condensed and passed into a phase separator. A stream of liquid phase is withdrawn from the phase separator, is passed through a throttling valve and the condenser, in sequence. Further cooling for the condenser is thus provided.

**5547019**

### **THERMOELECTRIC INTERCOOLER COOLING TURBOCHARGED AIR**

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An active intercooler for heating or cooling a fluid passing through the intercooler. The intercooler may be used to cool gases from the compression stage of an engine turbocharger in order to increase engine horsepower. The intercooler could also be used to cool the oil in an engine or transmission. Alternately, the intercooler could be used to heat or cool the air provided to the passenger compartment of a vehicle. The active intercooler includes a chamber through which the fluid flows. A thermoelectric heat pump is attached to the chamber in order to remove and dissipate heat from the fluid flowing through the chamber. A control system is provided to control the current supplied to the thermoelectric heat pump and thus the cooling capacity of the thermoelectric heat pump. A heat sink including a plurality of fins is attached to the thermoelectric heat pump on a surface opposite the chamber in order to increase the ability of the thermoelectric heat pump to dissipate heat.