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(54) **Title:** SHIP WITH A CARBON DIOXIDE CAPTURE SYSTEM

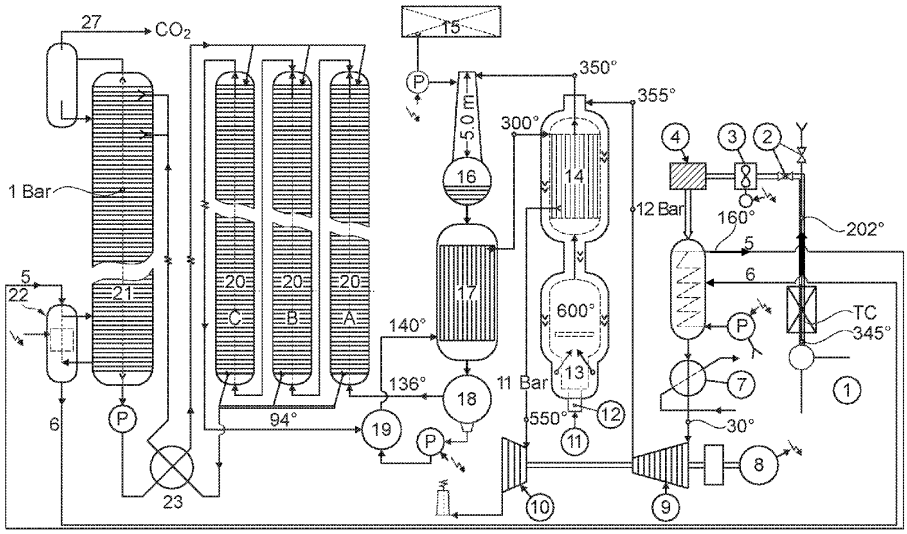

Fig. 1

(57) **Abstract:** The invention is a ship with a flue gas Carbon Dioxide capture and storage plant, said ship comprising a main engine (1) such as a slow running Diesel engine (1) providing flue gas (FG). The flue gas (FG) is led via a flue gas heat exchanger (6) with a thermal fluid exit (5) to a re-boiler (22), said flue gas heat exchanger (6) arranged for cooling said flue gas (FG), Further cooled flue gas (FG) led into a turbine compressor (9) compressing it up to a compressed flue gas (CFG). The turbine]compressor (9) may be common-axial with a turbine expander (10), said expander (10) for expanding resulting CO2-reduced flue gas (CRFG). The compressed flue gas (CFG) led into a high pressure shell of a HTHE (14) and further to a connected high pressure shell of a combustion chamber (13) enveloped by a perforated inner wall for receiving said compressed flue gas (CFG), The combustion chamber (13) is provided with a fuel feed (11) and a pre-mix gas burner (12) for afterburning said compressed flue gas (CFG), wherein said afterburning of said CFG also burns out

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remaining methane from said slow running Diesel engine, resulting in hot afterburned compressed flue gas (ACFG) thus enriched in CO2, e.g, of 600 Celsius, The afterburned compressed flue gas (ACFG) is heat exchanged in said HTHE with returning resulting CO2-reduced flue gas (CRFG). The CO2-reduced flue gas (CRFG) as such shall be heated to e.g. 550 Celsius to go to said turbine expander (10), The cooled afterburned compressed flue gas (ACFG) is sent through one or more CO2-absorber columns (20) exchanging CO2 into a K2C03/water solution, forming CO2-reduced flue gas (CRFG) which is returned at e.g. 94 Celsius via a re-humidifier (19), via at e.g, 140 Celsius through said LTHE (17) and further at e.g, 300 Celsius via said HTHE (14) to about 550 Celsius and to said expander (10) generating electrical energy at generator (8). The CO2-absorber (20) leading said CO2-enriched absorber solution to a C02-stripper (21), operating at e.g. 1 Bar and exporting CO2 to a CO2-compressor (26) to a CO2-export line (28) to onboard CO2 pressure tanks.