

### ABSTRACT

According to the present invention, boiler water is pressurized so that its boiling point is set at approximately 200°C to 320°C. The boiler water is heated in at least two stages. Thermal energy of gases containing chlorine compounds is used to heat the water to its boiling point. Thermal energy of gases which do not contain chlorine compounds is used to heat the water from its boiling point until superheated steam of a given temperature is generated. The heating which uses the thermal energy of gases containing chlorine compounds is accomplished using the thermal energy from the combustion of pyrolysis gases obtained from a pyrolysis means in which waste material is supplied into a chamber containing a fluidized bed medium which has been heated to at least 300°C, and a pyrolytic reaction is induced. The heating which uses the thermal energy of gases which do not contain chlorine compounds is accomplished using the thermal energy obtained from a char combustion means to combust char in which a char mixture consisting of unpyrolyzed residue and fluidized bed medium removed from the pyrolysis means is fluidized by a stream of air, and the unpyrolyzed residue is combusted.