(RPF), or the like), an increase or decrease of corrosive components, or the like during a boiler operation.

[0022]

According to still another aspect of the present invention, there is provided a boiler including a heat recovery portion that recovers heat of a combustion gas generated by a combustion furnace and a dust collector that filters and collects dust contained in a gas which has passed through the heat recovery portion, a connecting part, to which a recovery pipe capable of recovering a gas in a pipe communicating and connecting the heat recovery portion and the dust collector to each other is connected; and an estimation unit that estimates a content of an alkaline metal and/or chlorine in a fuel input into the combustion furnace, based on a content of fine salt particles in a gas recovered via the recovery pipe.

[0023]

When such a configuration is adopted, the exhaust gas before being collected by the dust collector of the boiler can be recovered via the pipe that communicates and connects the heat recovery portion and the dust collector to each other and the recovery pipe. For this reason, it is possible to appropriately monitor the content of the fine salt particle (KCl or the like) in the exhaust gas before being collected by the dust collector.

CLAIMS

1. A monitoring method for a boiler that is a method of monitoring an operation state of the boiler, the monitoring method comprising:

an exhaust gas collection process of collecting an exhaust gas generated by combustion of a fuel input into a combustion furnace of the boiler; and

an estimation process of estimating a content of an alkaline metal and/or chlorine in the fuel based on a content of a fine salt particle in the exhaust gas collected in the exhaust gas collection process.

2. The monitoring method for a boiler according to claim 1,

wherein in the exhaust gas collection process, the exhaust gas on an upstream side of a dust collector of the boiler is collected.

3. The monitoring method for a boiler according to claim 1 or 2,

wherein in the exhaust gas collection process, the exhaust gas is collected at a predetermined frequency.

4. The monitoring method for a boiler according to claim 1 or 2,

wherein in the exhaust gas collection process, the exhaust gas is collected when a type of the fuel is changed

and/or when an abnormality is found in the operation state of the boiler.

5. A controlling method for a boiler, comprising:

the monitoring method for a boiler according to any one of claims 1 to 4; and

a control process of controlling a load on the boiler and/or a maintenance operation of the boiler based on the content estimated in the estimation process of the monitoring method for a boiler.

6. An adjustment method for a fuel or the like, comprising:

the monitoring method for a boiler according to any one of claims 1 to 4; and

an adjustment process of changing, based on a content estimated in the estimation process of the monitoring method for a boiler, at least any one of an amount, a composition, a type, and a mixed firing ratio of the fuel input into the combustion furnace, a supply amount of an additive input into the combustion furnace, a supply amount of a fluid medium input into the combustion furnace, and/or an extraction amount of the fluid medium from the combustion furnace.

7. A monitoring device for a boiler that is a device monitoring an operation state of the boiler, the monitoring device comprising:

an exhaust gas collection portion that collects an exhaust gas generated by combustion of a fuel input into a combustion furnace of the boiler; and

an estimation unit that estimates a content of an alkaline metal and/or chlorine in the fuel based on a content of a fine salt particle in the exhaust gas collected by the exhaust gas collection portion.

8. A controlling device for a boiler, comprising:

the monitoring device for a boiler according to claim 7; and

a control unit that controls a load on the boiler and/or a maintenance operation of the boiler based on a content estimated by the estimation unit of the monitoring device for a boiler.

9. An adjustment device for a fuel or the like, comprising:

the monitoring device for a boiler according to claim 7; and

an adjusting unit that changes, based on a content estimated by the estimation unit of the monitoring device for a boiler, at least any one of an amount, a composition, a type, and a mixed firing ratio of the fuel input into the combustion furnace, a supply amount of an additive input into the combustion furnace, a supply amount of a fluid medium input into the combustion furnace, and/or an

extraction amount of the fluid medium from the combustion furnace.

10. A boiler comprising:

a heat recovery portion that recovers heat of a combustion gas generated by a combustion furnace;

a dust collector that filters and collects dust contained in a gas which has passed through the heat recovery portion;

a connecting part, to which a recovery pipe capable of recovering a gas in a pipe communicating and connecting the heat recovery portion and the dust collector to each other is connected; and

an estimation unit that estimates a content of an alkaline metal and/or chlorine in a fuel input into the combustion furnace, based on a content of fine salt particles in a gas recovered via the recovery pipe.