CLAIMS

1. A treatment apparatus for treating an effluent gas comprising:

a combustion chamber;
a burner;
an inlet for receiving secondary combustion air;
an exhaust gas outlet for outputting exhaust gases from said combustion chamber;
a heat exchanger for exchanging heat between a first fluid and a second fluid flowing through respective first and second fluid flow paths, said first fluid flow path being connected to said inlet such that said secondary combustion air flows from said inlet into said first fluid flow path and said second fluid flow path being connected to said outlet such that said exhaust gases received at said outlet flow into said second fluid flow path;
said heat exchanger comprising a fluid flow communication path for providing a path for flow of a portion of said exhaust gases from said second fluid into said first fluid; and
at least one inlet aperture for inputting said first fluid to said combustion chamber.

2. A treatment apparatus according to claim 1, wherein said fluid flow communication path is configured to provide at least one of a predetermined quantity and proportion of said second fluid to said first fluid.

3. A treatment apparatus according to claim 1 or 2, wherein said fluid flow communication path comprises a calibrated flow inlet extending from said second fluid flow path into a venturi within said first fluid flow path.

4. A treatment apparatus according to claim 3, wherein said venturi comprises an inlet facing said calibrated flow inlet and operable in a cleaning mode to receive a gas at an increased pressure, said gas at said increased pressure acting to clear particulates from said calibrated flow inlet.

5. A treatment apparatus according to any preceding claim, wherein said first fluid flow path comprises a plurality of tubes and said second fluid flow path comprises a further tube said plurality of tubes being within said further tube.

6. A treatment apparatus according to claim 5, wherein said plurality of tubes are connected to an inner tube arranged within said further tube such that said first fluid flows from said plurality of tubes to said inner tube, said plurality of inlet apertures lying on an inner surface of said inner tube.

7. A treatment apparatus according to any preceding claim, comprising a cooling jacket arranged around said combustion chamber and said heat exchanger, said cooling jacket being configured to receive a flow of cooling fluid, said heat exchanger being configured such that said exhaust gas flow is output to said cooling fluid within said cooling jacket at a plurality of output apertures arranged at different locations around an outer circumference of said heat exchanger.

8. A treatment apparatus according to claim 7, when dependent on one of claim 5 or 6, wherein said plurality of output apertures are arranged around a circumferential outer surface of said further tube.

9. A treatment apparatus according to claim 8, wherein said further tube is configured to receive said exhaust gases at one end and said plurality of output apertures are arranged towards the other end of said further tube.

10. A treatment apparatus according to claim 8 or 9, wherein said plurality of output apertures are arranged in a spiral around a circumference of said outer surface of said further tube.

11. A treatment apparatus according to any preceding claim, wherein said at least one inlet aperture comprises a plurality of inlet apertures arranged in a plurality of rings along a length of an outer surface of said combustion chamber.

12. A treatment apparatus according to any preceding claim, wherein said at least one aperture comprises a plurality of inlet apertures having a size that varies along a length of said combustion chamber.

13. A treatment apparatus according to any preceding claim, wherein said at one inlet aperture comprises a fluid deflecting element associated with said aperture.

14. A treatment apparatus according to claim 13, said deflecting element is configured to deflect a fluid output by said corresponding inlet aperture away from said burner.

15. A treatment apparatus according to any preceding claim, wherein said burner comprises an open flame burner.

16. A treatment apparatus according to any preceding claim, wherein said burner comprises a plurality of burner heads.

17. A treatment apparatus according to any preceding claim, wherein said exhaust gas outlet is at an opposite end of said combustion chamber to said burner.

18. A method of treating an effluent gas using a burner within a combustion chamber said method comprising:

receiving secondary combustion air at an inlet;
passing said secondary combustion chamber through a first fluid flow path within a heat exchanger for exchanging heat between a first fluid and a second fluid flowing through respective first and second fluid flow paths;
passing exhaust gases from said combustion chamber through said second fluid flow path within said heat exchanger, said heat exchanger comprising a flow connecting path between said first and second fluids such that a portion of said second fluid flowing through said heat exchanger flows into said first fluid;
inputting said first fluid to said combustion chamber through at least one aperture.

19. A treatment apparatus according to any preceding claim, wherein said heat exchanger is arranged around said combustion chamber.