**What is claimed is:**

1. A gasification furnace, comprising:

an outer shell having an outer shell inlet formed at a top of the outer shell and an outer shell outlet formed at a bottom of the outer shell;

an inner shell which is disposed in and spaced apart from the outer shell, defines a gasification chamber therein, has an inner shell inlet corresponding to the outer shell inlet and formed at a top of the inner shell, and an inner shell outlet corresponding to the outer shell outlet formed at a bottom of the inner shell, and is fabricated by a membrane wall having a cooling water inlet and a cooling water outlet;

a nozzle disposed at the tops of the outer shell and the inner shell so as to extend into the gasification chamber through the outer shell inlet and the inner shell inlet;

a lower shell connected with a lower portion of the outer shell, defining a slag exhausting chamber therein, and having a slag exhausting port formed at a bottom of the lower shell and a gas discharging port formed in an upper portion of a side wall of the lower shell, wherein the gasification chamber is communicated with the slag exhausting chamber via the outer shell outlet and the inner shell outlet;

a cooler connected with an outer bottom wall of the outer shell around the outer shell outlet, and having a cooling passage formed therein, a cooler water inlet, and a cooler water outlet;

a positioning member disposed between the inner shell and an inner bottom wall of the outer shell; and

a gas guiding pipe defining an upper end connected with the cooler, and a lower end extended downward in the slag exhausting chamber, wherein the gas guiding pipe has a cooling water passage formed in a wall of the gas guiding pipe, a water inlet and a water outlet which are communicated with the cooling water passage respectively.

2. The gasification furnace according to claim 1, wherein the inner shell comprises:

an upper header being annular so as to define the inner shell inlet;

a lower header being annular so as to define the inner shell outlet; and

a plurality of cooling pipes extended side by side in an up and down direction, wherein two ends of each cooling pipe are connected with the upper and lower headers respectively.

3. The gasification furnace according to claim 2, wherein each of the upper and lower headers

is configured as an annular pipe.

4. The gasification furnace according to claim 1, wherein the cooling water inlet is positioned in a lower portion of the inner shell, and the cooling water outlet is positioned in an upper portion of the inner shell.

5. The gasification furnace according to claim 1, wherein the outer shell comprises:

an upper cover;

a lower cover; and

a straight cylinder defining two ends connected with the upper cover and the lower cover respectively.

6. The gasification furnace according to claim 1, wherein the lower end of the gas guiding pipe is extended below a liquid level of cooling water in the lower shell.

7. The gasification furnace according to claim 1, wherein the cooler is an annular plate and the cooler water outlet is configured as an annular and flat slot extended in a circumferential direction of the annular plate.

8. The gasification furnace according to claim 1, wherein the cooler is an annular plate, and an opening direction of the cooler water outlet of the cooler is oriented towards or away from a center axis of the annular plate in a horizontal direction.

9. The gasification furnace according to claim 1, wherein the cooler is an annular plate, and an opening direction of the cooler water outlet of the cooler is inclined downward and oriented towards or away from a center axis of the annular plate.

10. The gasification furnace according to claim 1, the positioning member comprises:

an annular trough mounted on the inner bottom wall of the outer shell around the outer shell outlet and defining an annular groove; and

an annular insertion plate defining an upper end mounted on an outer bottom wall of the inner shell around the inner shell outlet and a lower end inserted into the annular groove.

11. The gasification furnace according to any one of claims 1-10, further comprising:

a cooling panel having a cooling panel passage, a cooling panel water inlet and a cooling panel water outlet which are communicated with the cooling panel passage respectively, wherein an upper end of the cooling panel is connected with the outer bottom wall of the outer shell, the cooling panel is fitted over the gas guiding pipe so as to define a gas discharging space therebetween, and the gas discharging port is communicated with an upper portion of the gas

discharging space.

12. The gasification furnace according to claim 11, wherein a lower end of the cooling panel is located below the liquid level of the cooling water in the lower shell, and the lower end of the gas guiding pipe is located above the liquid level of the cooling water in the lower shell.

13. The gasification furnace according to any one of claims 1-10, further comprising:

a cooling panel having a cooling panel passage, a cooling panel water inlet and a cooling panel water outlet which are communicated with the cooling panel passage respectively, wherein an upper end of the cooling panel is connected with the outer bottom wall of the outer shell, the cooling panel is fitted in the gas guiding pipe so as to define a gas discharging space therebetween, and the gas discharging port is communicated with an upper portion of the gas discharging space.

14. The gasification furnace according to claim 13, wherein a lower end of the cooling panel is located above the liquid level of the cooling water in the lower shell, and the lower end of the gas guiding pipe is located below the liquid level of the cooling water in the lower shell.

15. The gasification furnace according to claim 1, wherein a plurality of the water outlets of the gas guiding pipe are formed in an inner circumferential wall of the gas guiding pipe and distributed in an up and down direction and a circumferential direction of the gas guiding pipe.

16. The gasification furnace according to claim 1, wherein the cooler and the gas guiding pipe are integrally formed.

## CLAIMS

1. A gasification furnace, comprising:

an outer shell having an outer shell inlet formed at a top of the outer shell and an outer shell outlet formed at a bottom of the outer shell;

an inner shell which is disposed in and spaced apart from the outer shell, defines a gasification chamber therein, has an inner shell inlet corresponding to the outer shell inlet and formed at a top of the inner shell, and an inner shell outlet corresponding to the outer shell outlet formed at a bottom of the inner shell, and is fabricated by a membrane wall having a cooling water inlet and a cooling water outlet;

a nozzle disposed at the tops of the outer shell and the inner shell so as to extend into the gasification chamber through the outer shell inlet and the inner shell inlet;

a lower shell connected with a lower portion of the outer shell, defining a slag exhausting chamber therein, and having a slag exhausting port formed at a bottom of the lower shell and a gas discharging port formed in an upper portion of a side wall of the lower shell, wherein the gasification chamber is communicated with the slag exhausting chamber via the outer shell outlet and the inner shell outlet;

a cooler connected with an outer bottom wall of the outer shell around the outer shell outlet, and having a cooling passage formed therein, a cooler water inlet, and a cooler water outlet;

a positioning member disposed between the inner shell and an inner bottom wall of the outer shell,

wherein the positioning member comprises:

an annular trough mounted on the inner bottom wall of the outer shell around the outer shell outlet and defining an annular groove; and

an annular insertion plate defining an upper end mounted on an outer bottom wall of the inner shell around the inner shell outlet and a lower end inserted into the annular groove;

and

a gas guiding pipe defining an upper end connected with the cooler, and a lower end extended downward in the slag exhausting chamber, wherein the gas guiding pipe has a cooling water passage formed in a wall of the gas guiding pipe, a water inlet and a water outlet which are communicated with the cooling water passage respectively.

2. The gasification furnace according to claim 1, wherein the inner shell comprises:

an upper header being annular so as to define the inner shell inlet;

a lower header being annular so as to define the inner shell outlet; and

a plurality of cooling pipes extended side by side in an up and down direction, wherein two ends of each cooling pipe are connected with the upper and lower headers respectively.

3. The gasification furnace according to claim 2, wherein each of the upper and lower headers is configured as an annular pipe.

4. The gasification furnace according to claim 1, wherein the cooling water inlet is positioned in a lower portion of the inner shell, and the cooling water outlet is positioned in an upper portion of the inner shell.

5. The gasification furnace according to claim 1, wherein the outer shell comprises:

an upper cover;

a lower cover; and

a straight cylinder defining two ends connected with the upper cover and the lower cover respectively.

6. The gasification furnace according to claim 1, wherein the lower end of the gas guiding pipe is extended below a liquid level of cooling water in the lower shell.

7. The gasification furnace according to claim 1, wherein the cooler is an annular plate and the cooler water outlet is configured as an annular and flat slot extended in a circumferential direction of the annular plate.

8. The gasification furnace according to claim 1, wherein the cooler is an annular plate, and an opening direction of the cooler water outlet of the cooler is oriented towards or away from a center axis of the annular plate in a horizontal direction.

9. The gasification furnace according to claim 1, wherein the cooler is an annular

plate, and an opening direction of the cooler water outlet of the cooler is inclined downward and oriented towards or away from a center axis of the annular plate.

10. The gasification furnace according to any one of claims 1-9, further comprising:

a cooling panel having a cooling panel passage, a cooling panel water inlet and a cooling panel water outlet which are communicated with the cooling panel passage respectively, wherein an upper end of the cooling panel is connected with the outer bottom wall of the outer shell, the cooling panel is fitted over the gas guiding pipe so as to define a gas discharging space therebetween, and the gas discharging port is communicated with an upper portion of the gas discharging space.

11. The gasification furnace according to claim 10, wherein a lower end of the cooling panel is located below the liquid level of the cooling water in the lower shell, and the lower end of the gas guiding pipe is located above the liquid level of the cooling water in the lower shell.

12. The gasification furnace according to any one of claims 1-9, further comprising:

a cooling panel having a cooling panel passage, a cooling panel water inlet and a cooling panel water outlet which are communicated with the cooling panel passage respectively, wherein an upper end of the cooling panel is connected with the outer bottom wall of the outer shell, the cooling panel is fitted in the gas guiding pipe so as to define a gas discharging space therebetween, and the gas discharging port is communicated with an upper portion of the gas discharging space.

13. The gasification furnace according to claim 12, wherein a lower end of the cooling panel is located above the liquid level of the cooling water in the lower shell, and the lower end of the gas guiding pipe is located below the liquid level of the cooling water in the lower shell.

14. The gasification furnace according to claim 1, wherein a plurality of the water outlets of the gas guiding pipe are formed in an inner circumferential wall of the gas guiding pipe and distributed in an up and down direction and a circumferential direction of the gas guiding pipe.

15. The gasification furnace according to claim 1, wherein the cooler and the gas

guiding pipe are integrally formed.