CLAIMS:

1. A furnace comprising:

a vessel that defines a chamber therein for holding a molten material as a body of liquid;

a fluid inlet for introducing a fluid selected to interact with the liquid, into the chamber below ~~a~~ an intended level of the body of liquid to cause the fluid to interact with the liquid and to migrate therethrough towards an outlet for discharging a product of the interaction from the chamber;

a product removing device arranged to separate the product from the liquid; and

a liquid circulation passage having a weir which is operatively located at a predefined vertical height from a bottom of the furnace near the intended level of the body of liquid, and a port which is located remote from the weir and in fluid communication with the fluid inlet so as to enable the liquid to flow over the weir through the liquid circulation passage and through the port, so as to control the intended level of the body of liquid as the liquid flows over the weir.

2. The furnace as claimed in claim 1, wherein the port is configured to draw the liquid therethrough to mix with the fluid, so that the mixture is introduced into the chamber through the fluid inlet.

3. The furnace as claimed in claim 2, wherein the mixture is caused to migrate through the liquid~~, and wherein the weir is operatively located near an intended level of the body of liquid to control the level of the body of liquid as the liquid flows over the weir~~.

4. The furnace as claimed in any one of the preceding claims, wherein the furnace is operable as a fluid reformer and arranged to cause the fluid to break down into one or more of its constituent elements.

5. The furnace as claimed in any one of the preceding claims, wherein the ~~furnace includes a~~ product removing device ~~arranged~~ is a skimming device for skimming a surface of the body of liquid in the chamber, wherein the skimming device includes a moveable member that automatically skims the surface of the body of liquid to separate the product ~~from the liquid~~ therefrom, and wherein a driving arrangement is provided to drive the moveable member of the skimming device.

~~6. The furnace as claimed in claim 5, wherein the product removing device is a skimming device for skimming a surface of the body of liquid in the chamber.~~

~~7~~6. The furnace as claimed in claim 5 ~~or claim 6~~, wherein the product removing device is in communication with the outlet to discharge the product from the outlet.

~~8~~7. The furnace as claimed in ~~any one of claims 5 to 7~~ claim 5 or claim 6, wherein the product includes a fluid product and a solid product, and wherein the outlet is arranged to discharge one or both of the fluid product and the solid product.

~~9~~8. The furnace as claimed in claim ~~8~~ 7, wherein the outlet is an upwardly angled discharge passage in communication with the product removing device, wherein the product removing device is arranged to cause the solid product to be urged along the upwardly angled discharge passage, while enabling the fluid product to escape, and wherein the product removing device and the upwardly angled discharge passage are arranged such that the liquid is enabled to flow back into the chamber under the influence of gravity, if the liquid is inadvertently moved into the upwardly angled discharge passage, thereby separating the liquid from the solid product.

~~10. The furnace as claimed in claim 6, wherein the skimming device includes a moveable member that automatically skims the surface of the body of liquid to separate the product therefrom, and wherein a driving arrangement is provided to drive the moveable member of the skimming device.~~

~~11~~9. The furnace as claimed in ~~claim 5~~ any one of the preceding claims, wherein the product removing device is a pump, and wherein the pump includes a plurality of vanes or lobes arranged to separate the product from the liquid in use.

~~12~~10. The furnace as claimed in any one of the preceding claims, wherein a fluid acceleration device is provided at the fluid inlet for accelerating the fluid therethrough, with the fluid acceleration device in fluid communication with the port of the liquid circulation passage.

~~13~~11. The furnace as claimed in claim ~~12~~ 10, wherein the fluid acceleration device is any one of a venturi, a nozzle, an aspirator, an educator, an ejector, or a jet pump.

~~14~~12. The furnace as claimed in claim ~~12~~ 10 or claim ~~13~~ 11 wherein the fluid acceleration device is configured to cause the fluid to mix with the liquid to form bubbles.

~~15~~13. The furnace as claimed in claim 4, wherein the vessel is arranged to hold a molten material as the body of liquid in use.

~~16~~14. The furnace as claimed in claim ~~15~~ 13, wherein the molten material is a molten metal or a molten salt.

~~17~~15. The furnace as claimed in claim ~~16~~ 14, wherein the furnace includes a fluid feed tube in fluid communication with the inlet for introducing the fluid into the chamber.

~~18~~16. The furnace as claimed in claim ~~17~~ 15, wherein the fluid that is introduced by the fluid feed tube is a feed gas or a feed liquid selected to interact with the molten metal or salt.

~~19~~17. A fluid feed component for use in a furnace as claimed in claim 1, the fluid feed component comprising:

an upper end arranged to be fixed to ~~a~~ the vessel ~~for holding a body of liquid in use~~; and

a lower end arranged to be provided below ~~a~~ the intended level of the body of liquid in the vessel~~;~~,

~~a~~ wherein the fluid inlet is near the lower end~~, for introducing a fluid into the vessel below the level of the body of liquid in the vessel so as to cause the fluid to interact with the liquid and to migrate therethrough; and~~

~~a~~ , wherein the liquid circulation passage ~~extending~~ is an elongate passage that extends from the upper end of the fluid feed component towards the lower end~~, having a~~ thereof, wherein the weir ~~which~~ is ~~operatively locatable~~ defined near the ~~level~~ upper end of the ~~body of~~ liquid~~,~~ circulation passage, and ~~a~~ wherein the liquid circulation passage of the fluid feed component includes the port ~~which is located remote from the weir and in fluid communication with the fluid inlet so as to enable the liquid to flow over the weir through the liquid circulation passage and through the port~~.

~~20~~18. A furnace control method ~~of reforming a fluid, the method~~ comprising:

heating material until it becomes molten so as to form a body of liquid in a vessel that defines a chamber therein for holding the liquid;

introducing a fluid selected to interact with the liquid, into the chamber below ~~a~~ an intended level of the body of liquid with an inlet, to cause the fluid to interact with the liquid and to migrate therethrough towards an outlet for discharging a product of the interaction from the chamber;

providing a product removing device arranged to separate the product from the liquid;

utilising a liquid circulation passage having a weir which is operatively located at a predefined vertical height from a bottom of the furnace near the intended level of the body of liquid and a port which is located remote from the weir and in fluid communication with the fluid inlet; and

enabling the liquid to flow over the weir through the liquid circulation passage and through the port so as to control the intended level of the body of liquid as the liquid flows over the weir ~~through the liquid circulation passage and through the port~~.