CLAIMS:

1. A fuel incinerating system comprising:

a) an ejector system comprising:

an ejection nozzle configured to eject fuel at a predefined forced velocity, and

a multi-stage fuel-air mixing system having an inlet end and an outlet end, the inlet end being in fluidic communication with the fluid ejection nozzle to receive the fuel ejected from the nozzle, wherein the fuel-air mixing system is configured to entrain air to be mixed with the fuel to form a fuel-air mixture,

the multi-stage fuel-air mixing system comprising a plurality of concentric fuel intake tubes arranged in series, each intake tube having an inlet and an outlet, wherein the inlet of each intake tube has a cross sectional area greater than a cross sectional area of the outlet of a preceding intake tube, thereby providing an annular gap between adjacent intake tubes for entraining additional air when the fuel-air mixture is passed from one intake tube into a subsequent intake tube;

b) a combustor positioned downstream of the multi-stage fuel-air mixing system, the combustor having an inlet end in fluidic communication with the outlet end of the multi-stage fuel-air mixing system, and an outlet end, the combustor defining a combustion chamber between the inlet and the outlet thereof, the combustor further being in communication with a primary ignition source; and

c) an exhaust system comprising a primary exhaust pipe having an inlet end in fluidic communication with the outlet end of the combustor and an outlet end to exhaust products of fuel combustion;

wherein:

the multi-stage fuel-air mixing system and the combustor are oriented horizontally, and the primary exhaust pipe is oriented horizontally, or the primary exhaust pipe comprises a horizontally oriented portion and a vertically oriented portion having the outlet end to exhaust the products of fuel combustion; or

the multi-stage fuel-air mixing system and the combustor are oriented downwardly at an angle to horizontal, and the primary exhaust pipe comprises a

downwardly oriented angled portion and a vertically oriented portion having the outlet end to exhaust the products of fuel combustion, or

the multi-stage fuel-air mixing system and the combustor are oriented upwardly at an angle to horizontal, and the primary exhaust pipe comprises an upwardly oriented angled portion and a vertically oriented portion having the outlet end to exhaust the products of fuel combustion, or

the multi-stage fuel-air mixing system and the combustor are oriented vertically downwardly, such that the fuel-air mixture and the products of the fuel combustion move vertically in a downward direction, and the primary exhaust pipe comprises a vertically oriented portion having the outlet end to exhaust the products of fuel combustion vertically in a downward direction;

and

wherein the exhaust system further comprises a secondary exhaust pipe concentric with the primary exhaust pipe, and having an inlet in communication with the outlet of the primary exhaust pipe and an outlet, wherein the inlet of the secondary exhaust pipe has a cross sectional area greater than a cross sectional area of the outlet of the primary exhaust pipe, thereby providing an annular gap between adjacent pipes for entraining air when the products of fuel combustion are passed from the primary exhaust pipe into the secondary exhaust pipe;

or

wherein the exhaust system further comprises a plurality of concentric secondary exhaust pipes, each having an inlet and an outlet, wherein a first of the plurality of the secondary exhaust pipes being concentric with the primary exhaust pipe, and the inlet of at least one of the secondary exhaust pipes has a cross sectional area greater than a cross sectional area of the outlet of the preceding exhaust pipe, thereby providing an annular gap between adjacent pipes for entraining air when the products of fuel combustion are passed from one exhaust pipe into a subsequent exhaust pipe, optionally each one of the secondary exhaust pipes has a cross sectional area greater than the cross sectional area of the outlet of the preceding exhaust pipe.

2. The incinerating system according to claim 1, wherein the multi-stage fuel-air mixing system and the combustor are oriented horizontally, and the primary exhaust pipe is oriented horizontally having the outlet end to exhaust the products of fuel combustion.

3. The incinerating system according to claim 2, wherein the multi-stage fuel-air mixing system and the combustor are oriented horizontally and the primary exhaust pipe comprises a horizontally oriented portion and a vertically oriented portion having the outlet end to exhaust the products of fuel combustion vertically in an upward direction.

4. The incinerating system according to claim 3, wherein the primary exhaust pipe comprises a connecting portion between the vertically oriented portion and the horizontally oriented portion.

5. The incinerating system according to claim 1, wherein the multi-stage fuel-air mixing system and the combustor are oriented downwardly at an angle relative to horizontal, and the primary exhaust pipe comprises a downwardly oriented angled portion and a vertically oriented portion having the outlet end to exhaust the products of fuel combustion.

6. The incinerating system according to claim 5, wherein the primary exhaust pipe comprises a connecting portion between the vertically oriented portion and the angled portion.

7. The incinerating system according to claim 1, wherein the multi-stage fuel-air mixing system and the combustor are oriented vertically downwardly, such that the fuel-air mixture and the products of the fuel combustion move vertically in a downward direction, and the primary exhaust pipe comprises a vertically oriented portion having the outlet end to exhaust the products of fuel combustion vertically in a downward direction.

8. The incinerating system according to any one of claims 1 to 7, wherein the ejection nozzle is coaxial with the multi-stage fuel-air mixing system.

9. The incinerating system according to any one of claims 1 to 8, wherein the combustor further comprises a flame holder.

10. The incinerating system according to any one of claims 1 to 9, wherein the exhaust pipe further comprises one or more air intake vents.

11. The incinerating system according to any one of claims 1 to 10, wherein the exhaust system further comprises one or more diffuser ducts, each having an inlet and an outlet, and stacked vertically upward from the outlet end of the secondary exhaust pipe, wherein at least one of the diffuser ducts has a cross sectional area increasing from the inlet end to the outlet end thereof.

12. The incinerating system according to claim 11, wherein the diffuser duct having an inlet in communication with the outlet end of the primary exhaust pipe has the cross sectional increasing from the inlet end to the outlet end thereof.

13. The incinerating system according to any one of claims 1 to 12, each one of the secondary exhaust pipes has a cross sectional area greater than the cross sectional area of the outlet of the preceding exhaust pipe.

14. The incinerating system according to any one of claims 1 to 13, wherein the outlet of the combustor and the inlet of the primary exhaust pipe are connected via a flange-ring connection.

15. The incinerating system according to any one of claims 1 to 14, wherein the system comprises one or more support members to horizontally secure the combustor and the inlet portion of the exhaust pipe to a surface.

16. The incinerating system according to claim 15, wherein the surface is a concrete pad or a skid.