

CLAIMS

What is claimed is:

1. An air cooling chamber assembly, comprising:
an air intake duct for receiving ambient air outside of an internal combustion engine;
an air cooling chamber for cooling the ambient air received from the air intake duct to generate cooled air; and
an air output duct for providing the cooled air generated from the air cooling chamber to the internal combustion engine,
wherein, the air cooling chamber assembly is connected to an air intake of the internal combustion engine to cool the ambient air to generate the cooled air prior to entering the internal combustion engine, and to provide the cooled air generated to the air intake of the internal combustion engine.
2. The air cooling chamber assembly of claim 1, wherein the air intake duct comprises:
a first end, wherein the first end receives the ambient air, and
an opposite, second end, wherein the second end provides the ambient air to the air cooling chamber.
3. The air cooling chamber assembly of claim 2, wherein the air output duct comprises:
a first end, wherein the first end receives the cooled air from the air cooling chamber, and
an opposite, second end, wherein the second end provides the cooled air received to the air intake of the internal combustion engine.
4. The air cooling chamber assembly of claim 3, wherein the air output duct

is shielded by one or more thermal shield materials to maintain low temperature of the cooled air in an engine compartment of the internal combustion engine.

5. The air cooling chamber assembly of claim 4, wherein the air cooling chamber comprises an evaporator, wherein the evaporator comprises:
an array of fins and a gaseous refrigerant tube having a first end and a second end,
wherein the first end of the gaseous refrigerant tube is connected to a low pressure line of a cooling device to receive a gaseous refrigerant, and the second end of the gaseous refrigerant tube is connected to an input of a compressor of the cooling device, and the evaporator cools the ambient air passing through the air cooling chamber to generate the cooled air.

6. The air cooling chamber assembly of claim 1, wherein air density of the cooled air from the air cooling chamber is increased due to a cooling process inside the air cooling chamber assembly.

7. The air cooling chamber assembly of claim 1, wherein high density cooled air from the air cooling chamber comprises increased amount of oxygen molecules, and the increased amount of oxygen molecules in the high density cooled air improves the fuel efficiency and reduces greenhouse gas emission of the internal combustion engine.

8. An internal combustion engine, comprising:
an air cooling chamber assembly, wherein the air cooling chamber assembly comprises:
an air intake duct for receiving ambient air outside of the internal combustion engine;
an air cooling chamber for cooling the ambient air received from the air intake duct to generate cooled air; and
an air output duct for providing the cooled air generated from the air

cooling chamber to the internal combustion engine,

wherein, the air cooling chamber assembly is connected to an air intake of the internal combustion engine to cool the ambient air to generate the cooled air prior to entering the internal combustion engine, and to provide the cooled air generated to the air intake of the internal combustion engine.

9. The internal combustion engine of claim 8, wherein the air intake duct comprises:

a first end, wherein the first end receives the ambient air, and

an opposite, second end, wherein the second end provides the ambient air to the air cooling chamber.

10. The internal combustion engine of claim 9, wherein the air output duct comprises:

a first end, wherein the first end receives the cooled air from the air cooling chamber, and

an opposite, second end, wherein the second end provides the cooled air received to the air intake of the internal combustion engine.

11. The internal combustion engine of claim 10, wherein the air output duct is shielded by one or more thermal shield materials to maintain low temperature of the cooled air in an engine compartment of the internal combustion engine.

12. The internal combustion engine of claim 11, wherein the air cooling chamber comprises an evaporator, wherein the evaporator comprises:

an array of fins and a gaseous refrigerant tube having a first end and a second end,

wherein the first end of the gaseous refrigerant tube is connected to a low pressure line of a cooling device to receive a gaseous refrigerant, and the second end of the gaseous refrigerant tube is connected to an input of a compressor of the cooling device,

and the evaporator cools the ambient air passing through the air cooling chamber to generate the cooled air.

13. The internal combustion engine of claim 6, wherein air density of the cooled air from the air cooling chamber is increased due to a cooling process inside the air cooling chamber assembly.

14. The internal combustion engine of claim 6, wherein high density cooled air from the air cooling chamber comprises increased amount of oxygen molecules, and the increased amount of oxygen molecules in the high density cooled air improves the fuel efficiency and reduces greenhouse gas emission of the internal combustion engine.

15. An internal combustion engine, comprising:
an air cooling chamber assembly powered by a standalone cooling device,
wherein the air cooling chamber assembly comprises:
an air intake duct for receiving ambient air outside of the internal combustion engine;
an air cooling chamber for cooling the ambient air received from the air intake duct to generate cooled air; and
an air output duct for providing the cooled air from the air cooling chamber to the internal combustion engine,
wherein, the air cooling chamber assembly is connected to an air intake of the internal combustion engine to cool the ambient air to generate the cooled air prior to entering the internal combustion engine, and to provide the cooled air generated to the air intake of the internal combustion engine.

16. The internal combustion engine of claim 15, wherein the air intake duct comprises:
a first end, wherein the first end receives the ambient air; and

an opposite, second end, wherein the second end provides the ambient air 301 to the air cooling chamber;

wherein the air output duct comprises:

a first end, wherein the first end receives the cooled air from the air cooling chamber, and

an opposite, second end, wherein the second end provides the cooled air received to the air intake of the internal combustion engine; and

wherein the air output duct is shielded by one or more thermal shield materials to maintain low temperature of the cooled air in an engine compartment of the internal combustion engine.

17. The internal combustion engine of claim 16, wherein the air cooling chamber comprises an evaporator, wherein the evaporator comprises:

an array of fins and a gaseous refrigerant tube having a first end and a second end, wherein the first end of the gaseous refrigerant tube is connected to a first end of an expansion valve and a second end of the expansion valve is connected to a high pressure line of the standalone cooling device of the automobile to receive a gaseous refrigerant, and the second end of the gaseous refrigerant tube is connected to a low pressure line and further connected to an input of a compressor of the standalone cooling device of the automobile, and the evaporator of the air cooling chamber cools the ambient air passing through the air cooling chamber to generate the cooled air.

18. The internal combustion engine of claim 17, wherein the standalone cooling device comprises:

a control unit powered by a first power connector and a second power connector of a battery, wherein the control unit controls the operation of the standalone cooling device, and the control unit turns on the standalone cooling device when the control unit detects from an ignition circuit of the internal combustion engine that an ignition of the internal combustion engine is on;

the compressor for compressing gaseous refrigerant of the standalone cooling device, wherein the compressor comprises a low pressure line connector connecting a low pressure line, a high pressure line connector connecting a high pressure line, a first power line connecting to a first power output line of the control unit, and a second power line connecting to a second power output line of the control unit;

a condenser, wherein the condenser comprises an array of fins and a gaseous refrigerant tube for cooling liquefy refrigerant using a DC fan after each compression cycle, wherein the DC fan is powered and controlled by a third power output line and a fourth power output line of the control unit, and

a receiver dryer, wherein the receiver dryer stores the liquefy refrigerant from the condenser and delivers the liquefy refrigerant to an expansion valve for lowering the pressure of the liquefy refrigerant to allow it to change from a liquid to gaseous,

wherein the first end of the expansion valve is connected to the first end of the gaseous refrigerant tube, and the second end of the expansion valve is connected to the high pressure line.

19. The internal combustion engine of claim 15, wherein air density of the cooled air from the air cooling chamber is increased due to a cooling process inside the air cooling chamber assembly.

20. The internal combustion engine of claim 15, wherein high density cooled air from the air cooling chamber comprises increased amount of oxygen molecules, and the increased amount of oxygen molecules in the high density cooled air improves the efficiency of the internal combustion engine.