SUMMARY

[0007a] According to a first aspect, there is provided a fuel authentication device, comprising a programmable processor programmed to cause the fuel authentication device to perform: obtaining a first unique identifier element (UIE) associated with a first fuel cartridge; obtaining host information associated with a host device configured to use fuel from the first fuel cartridge; determining that the first fuel cartridge is authorized for use with the host device, based on data exchanged via a data communication network with a remote cartridge tracking system, the first UIE, and the host information; and, transmitting authorization data to the host device indicating that the host device is permitted to use fuel from the first fuel cartridge.

[0007b] According to a second aspect, there is provided a fuel cartridge authentication system, comprising a programmable processor programmed to perform: obtaining a first unique identifier element (UIE) associated with a first fuel cell cartridge; obtaining host information associated with a host device configured to use fuel from the first cell cartridge; determining that the first cell cartridge is authorized for use with the host device, based on data exchanged via a data communication network with a remote database ; determining if the cartridge is authentic via a data exchange based on a UIE tracking system; and, transmitting authorization data to the communication device indicating that the cartridge is compatible with the host device.

Claims:

1. A fuel authentication device, comprising a programmable processor programmed to cause the fuel authentication device to perform:

obtaining a first unique identifier element (UIE) associated with a first fuel cartridge;

obtaining host information associated with a host device configured to use fuel from the first fuel cartridge;

determining that the first fuel cartridge is authorized for use with the host device, based on data exchanged via a data communication network with a remote cartridge tracking system, the first UIE, and the host information; and,

transmitting authorization data to the host device indicating that the host device is permitted to use fuel from the first fuel cartridge.

2. The fuel authentication device of claim 1, wherein the determination that the first fuel cartridge is authorized for use with the host device is further based on a user identifier associated with the host device.

3. The fuel authentication device of claim 1, wherein the processor is programmed to cause the fuel authentication device to perform:

obtaining a second unique identifier element associated with a second fuel cell cartridge;

receiveing fuel consumption information from the host device regarding use of fuel from the second fuel cartridge by the host device; and

transmitting the fuel consumption information to the remote cartridge tracking system.

4. The fuel authentication device of claim 1, further comprising wireless communication circuitry adapted for transmitting data to and receiving data from the host device, wherein the processor is programmed to transmit the authorization data to the host device via the communication circuitry.

5. The fuel authentication device of claim 1, further comprising the host device and a housing containing the host device and the programmable processor.

~~6. A mobile fuel cartridge locating device, comprising a display unit and a programmable processor programmed to cause a fuel cell authentication device to perform:~~

~~obtain information identifying a host device configured to receive fuel from a hydrogen cartridge;~~

~~obtain a geographic location for the mobile device;~~

~~transmit a request to a remote cartridge tracking system requesting points of sale at which hydrogen cartridges compatible with the host device may be obtained;~~

~~receive information regarding a plurality of points of sale in response to the transmitted request; and,~~

~~display the information on the display unit.~~

~~7. The device of claim 6, further comprising a user input device, wherein the processor is programmed to cause the fuel cartridge authentication device to perform:~~

~~obtain purchaser information identifying a purchaser;~~

~~receive, via the user input device, an indication of a selected point of sale, included in the plurality of points of sale;~~

~~transmit a request requesting purchase of a hydrogen cartridge compatible with the host device for the purchaser.~~

~~8. The device of claim 7, wherein the processor is programmed to cause the fuel cartridge authentication device to transmit a request requesting the purchased hydrogen cartridge be held at the point of sale for pickup.~~

~~9. The device of claim 7, wherein the processor is programmed to cause the fuel cartridge authentication device to transmit a request that the purchased hydrogen cartridge be shipped to the purchaser.~~

10. The device of claim 7, wherein the processor is programmed to cause the fuel cartridge authentication device to receive a unique identifier element for the hydrogen cartridge; and,

transmit authorization data to the host device indicating that the host device is permitted to withdraw fuel from the purchased fuel cartridge.

11. The mobile fuel cartridge locating device of claim 6, wherein the processor is programmed to cause the fuel cartridge authentication device to perform:

receive fuel consumption information indicating the use of one or more fuel cartridges by the host device;

determine an estimated amount of time before a fuel cartridge change will need to be performed for the host device; and,

display a notification on the display unit that additional fuel should be purchased for the host device, in response to the fuel consumption information.

12. A hydrogen fuel cartridge tracking system, comprising a programmable processor programmed to perform:

receive point of sale information for a first plurality of points of sale, the point of sale information including a location for a respective point of sale;

receive cartridge information for each of a plurality of hydrogen fuel cartridges, the point of sale information indicating one of the points of sale through which the respective cartridge may be purchased;

receive location information specifying a location of a purchaser;

identify a second plurality of points of sale, included in the first plurality of points of sale, based on the location information and point of sale information; and,

transmit the locations for each of the second plurality of points of sale to the purchaser.

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~~13. The tracking system of claim 12, wherein the processor is programmed to perform:~~

~~receive host device information identifying a host device configured to receive fuel from a cartridge;~~

~~receive an identifier, uniquely identifying one of the plurality of cartridges; and,~~

~~transmit an indication that the host device is authorized to withdraw fuel from the identified cartridge.~~

~~14. The tracking system of claim 12, wherein the processor is programmed to perform:~~

~~receive fuel consumption information indicating a withdrawal of fuel from one of the plurality of fuel cartridges; and,~~

~~transmitting an indication that fuel may not be withdrawn from the one of the plurality of fuel cartridges, based on the fuel consumption information.~~

~~15~~6. A fuel cartridge authentication system, comprising a programmable processor programmed to perform:

obtaining a first unique identifier element (UIE) associated with a first fuel cell cartridge;

obtaining host information associated with a host device configured to use fuel from the first cell cartridge;

determining that the first cell cartridge is authorized for use with the host device, based on data exchanged via a data communication network with a remote database ;

determining if the cartridge is authentic via a data exchange based on a UIE tracking system; and,

transmitting authorization data to the communication device indicating that the cartridge is compatible with the host device.

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~~167~~. The fuel cartridge authentication system of claim ~~156~~ further comprising;

the host contains a fuel cell and balance of plant;

the host system is configured to receive data communications;

the host system is configure with at least one control valve, whereby it can allow or refuse fluid flow of fuel from a connected cartridge;

transmitting to the host device indicating that the host device is or is not permitted to use fuel from the first cartridge; and,

the host system either permits the flow of fuel from the connected cartridge to the fuel cell or refuses the flow.