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(54) Title: IMPROVEMENTS RELATING TO INTERNAL COMBUSTION ENGINES

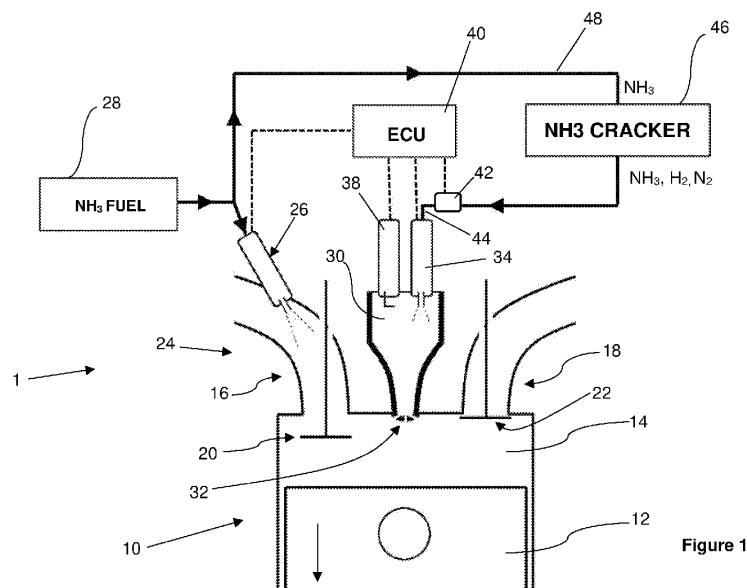


Figure 1

(57) Abstract: The disclose relates to an ammonia-fuelled internal combustion engine system. The engine system comprises a cracking device connectable to an ammonia fuel supply and configured, during operation of the engine, to produce a cracked fuel comprising a mixture of nitrogen and hydrogen by cracking of an ammonia fuel provided by the ammonia fuel supply. The engine system further comprises a main combustion chamber, an intake and an exhaust each in fluid communication with the main combustion chamber. A precombustion chamber is in fluid communication with the main combustion chamber via at least one orifice, the precombustion chamber further comprises a cracked fuel inlet to permit introduction of the cracked fuel, supplied from the cracking device, into the precombustion chamber. An ignition device is operatively positioned with the precombustion chamber and configured to ignite the cracked fuel in the precombustion chamber. The precombustion chamber and/or the orifice are configured to produce a stream of

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combusting fluid from the precombustion chamber to the main combustion chamber via the orifice, when cracked fuel is ignited in the precombustion chamber, so as to permit ignition of fuel present in the main combustion chamber. The engine system further comprises a sensor arrangement configured to measure properties of the cracked fuel and an electronic control device in communication with the sensor arrangement and with the ignition device. The electronic control device is configured to evaluate a characteristic of the hydrogen present in the cracked fuel using measurements received from the sensor arrangement and to control introduction of cracked fuel into the precombustion chamber according to those evaluated hydrogen characteristics.