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(54) DEVICE AND PROCESS FOR THE TREATMENT OF ENGINE FLUE GASES WITH HIGH OXYGEN EXCESS

(57) High oxygen concentration in the flue gas of lean burn engines is a major issue but also a challenge for the efficient treatment of gaseous pollutants. The present patent application discloses a method for removing oxygen from the exhaust gases of a lean burn engine by shifting gas mixture composition in order to make further processing of the flue gas possible in catalytic converters widely used in petrol engines emission control. The method relies on carbonate ion conductive electrochemical membranes that utilize the large CO_2 concentration gradient between the flue gases and the atmosphere. This results in a gradient in the electrochemical potential of the carbonate ions, in diffusion of the latter from the flue gases to the atmosphere and thus, in the removal of O_2 from the gas stream of the flue gases.

A device to remove O_2 from the flue gas stream using the above method is also described in the present patent application. Moreover, the suggested process to use the device for removing oxygen is described. The process includes installation of the oxygen removal device in the flue gas stream of lean burn engines at a proper temperature in flow contact with the particle filter and the catalytic converter for efficient treatment of toxic gaseous pollutants, like CO, NO and hydrocarbons.

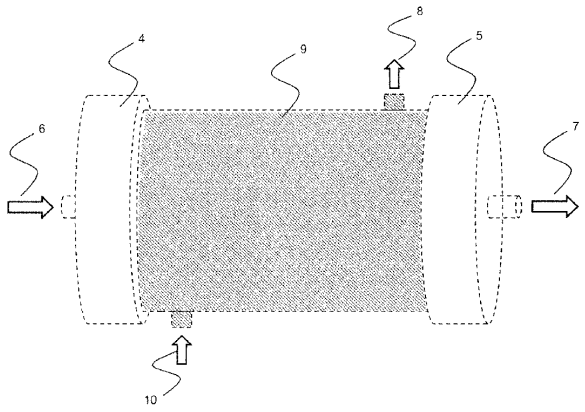

Figure 4

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