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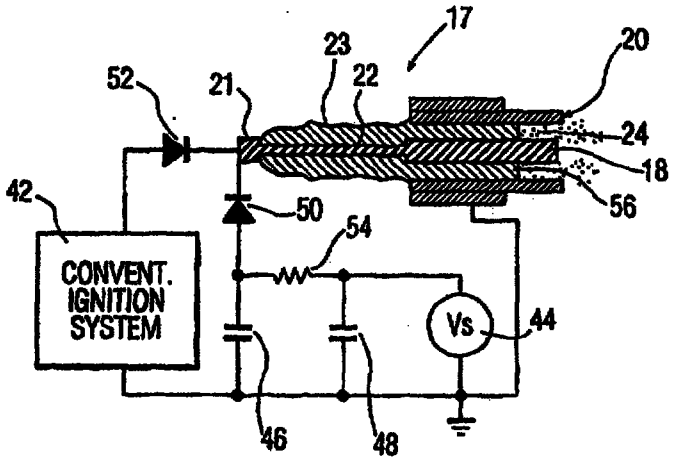
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(54) Title: TRAVELING SPARK IGNITION SYSTEM AND IGNITOR THEREFOR



(57) Abstract

A plasma ignitor, or plasma source, for igniting a combustible mixture in an internal combustion engine. The ignitor includes at least two spaced apart electrodes dimensioned and arranged such that an outwardly moving plasma is formed when a voltage is applied across the electrodes. The present invention is characterized by its efficient use of input electrical energy for driving the plasma ignitor and by an ignition plasma kernel which is several orders of magnitude larger than that produced by conventional spark plugs. Outward motion and expansion of the plasma kernel is produced by a Lorentz force thereon, arising from interaction between the applied voltage and current between the electrodes, through the mixture, after initial plasma generation in the mixture. Use of very lean combustible mixtures, in which the dilution of the mixture is achieved by use of exhaust gas recirculation, is made possible by the present ignition system. Improvement in engine efficiency, and a major reduction in NO_x exhaust gas pollutants are obtained.