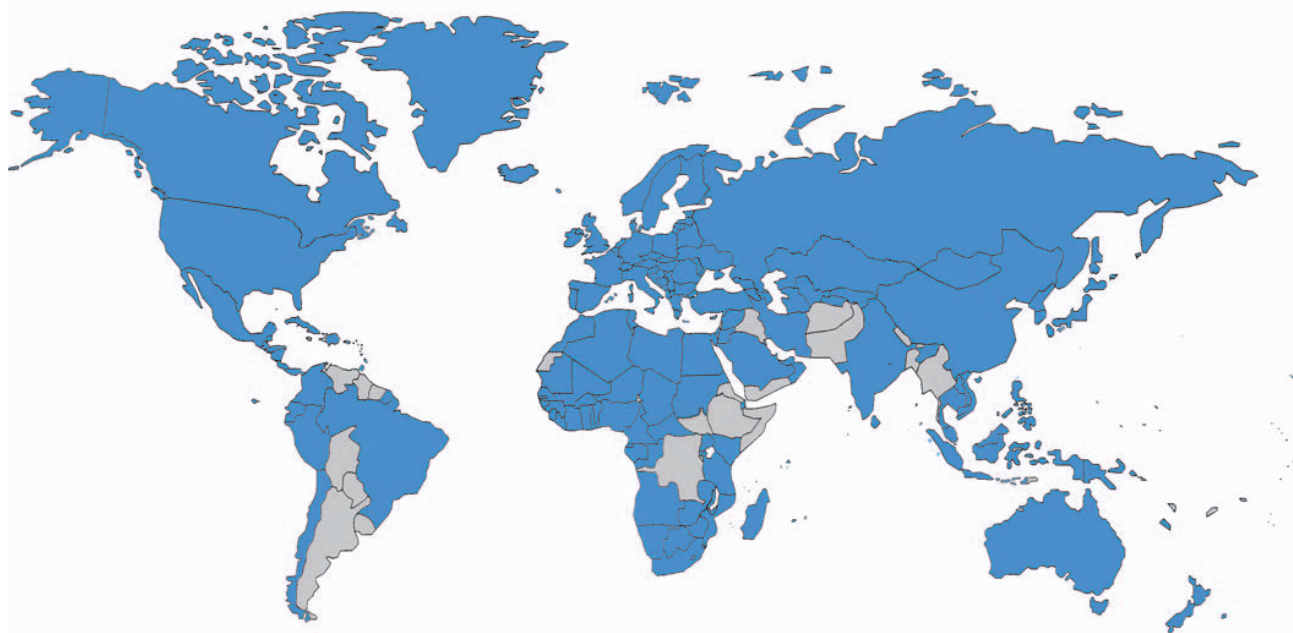


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<sup>1</sup> Extension of European patent possible.

<sup>2</sup> May only be designated for a regional patent (the "national route" via the PCT has been closed).

<sup>3</sup> Validation of European patent possible for international applications filed on or after 1 March 2015.

<sup>4</sup> Validation of European patent possible for international applications filed on or after 1 November 2015.

<sup>5</sup> Only international applications filed on or after 19 August 2014 will include the designation of Sao Tome and Principe for an ARIPO patent.

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

(54) Title: TWO-STAGED VACUUM BURNER

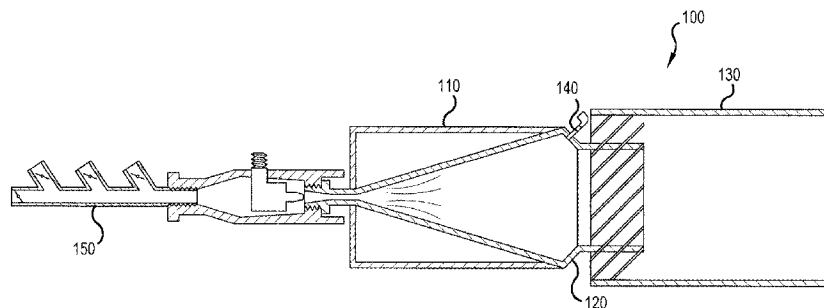


FIG. 1

(57) Abstract: A mixed-fuel vacuum burner-reactor (100) includes a primary combustion chamber (110) having a conical interior and a first set of directing blades. The conical interior is connected to an intake manifold (150) on one end and a reduction nozzle (120) on the other end. Injectors (140) are mounted perpendicularly to the reduction nozzle (120) to inject a second fuel into the primary combustion chamber (110). The reduction nozzle (120) is connected to a cylindrical secondary combustion chamber (130) having a second set of directing blades configured to direct air into the secondary combustion chamber (130). Methods of efficiently burning mixed fuels in a triple-vortex vacuum burner-reactor (100) are also disclosed. Vacuum conditions are created and fuels are introduced into the conical primary combustion chamber (110). The fuels are passed over a first set of directing blades to form three vortices before additional fuels are injected in a direction opposite to a direction of rotation of the first set of fuels.

