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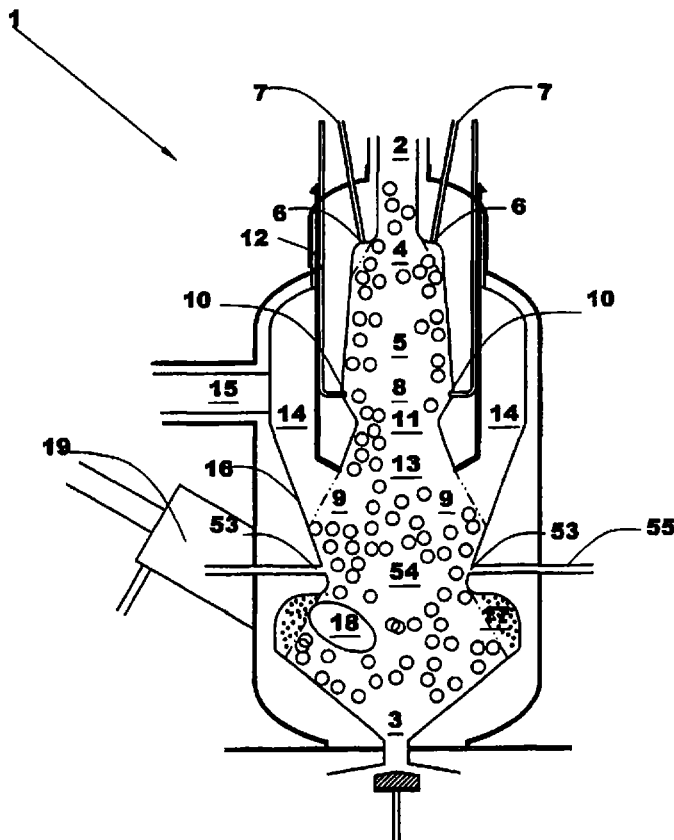
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(54) Title: MULTI-FACETED GASIFIER AND RELATED METHODS



(57) Abstract: A gasifier (1) is disclosed combining a fixed bed gasification section (4, 5, 8, 11 and 13) where coarse fuel entering through inlet (2) is gasified and an entrained flow gasification section (7) where fine fuel entering through one or more tangentially fired burners (19) or from a combustion gasification cylindrical chamber (18) is gasified. The fixed bed section includes upper (4 and 5) and lower (8, 11 and 13) sections. Coarse fuel is devolatilized in the upper fixed bed section (4 and 5) and subjected to elevated temperatures sufficient to crack and destroy tars and oils in the effluent gases. The entrained flow gasification section (17) is disposed in a lower plenum adjacent the lower fixed bed section (13). A plurality of injection ports (6, 10) is configured to introduce oxygen, steam, or air into different sections of the gasifier (1) to control temperature and operating conditions. Activated carbon may be formed in the upper fixed bed section (4, 5, 8, 11 and 13) and in the entrained flow section (17). The activated carbon may be used as a sorbent to remove pollutants from the effluent gases leaving the gasifier (1) through exit pipe (15). The gasifier (1) may be used with various coarse and fine fuel feedstocks.

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