

ABSTRACT

An apparatus for the combustion of organic waste such as poultry litter/manure, cow manure and swine manure, and/or human waste, and/or biomass using a moving grate over a stationary perforated plate to convert organic waste into usable energy. The unprocessed fuel is fed into the combustion chamber through a feed hopper by a moving grate being continuously pulled over a stationary perforated plate. The raw fuel is metered using a guillotine gate apparatus to control the depth of the fuel bed on the moving grate. Temperature controlled combustion air is directed under the stationary perforated plate (under fire air) into discreet controllable under fire air zones to initiate and drive the combustion process. The stationary plate is sectioned to match the discreet under fire air zones with holes and/or slots (perforations) shaped and sized for proper under fire air distribution and pressure drop through the plate. The under fire air is forced through the stationary perforated plate up through the moving grate into the moving bed of fuel. Additional temperature controlled combustion air is directed above the fuel bed to the over fire air nozzles positioned at strategic locations in the combustion chamber for complete combustion and emission control. The moving grate continues to pull the combusted fuel (ash) out of the combustion chamber and deposits it into an ash collection chamber equipped with automatic ash removal system. A conventional heat recovery unit (i.e. boiler, air heater or similar) placed over the combustion chamber converts the heat from the combustion process into a usable product. A boiler produces steam for process purposes and/or to generate electricity.