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(54) Title: CIRCULAR ECONOMY FOR PLASTIC WASTE TO POLYETHYLENE AND CHEMICALS VIA REFINERY CRUDE UNIT

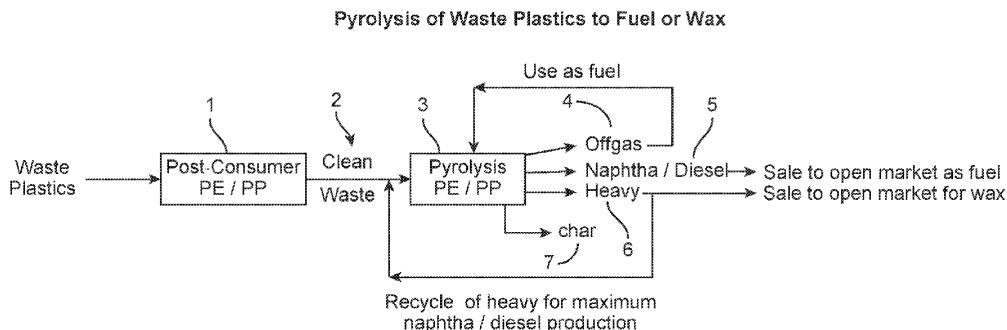


FIG. 1

(57) **Abstract:** Provided is a continuous process for converting waste plastic into recycle for polyethylene polymerization or for normal alpha olefins. The process comprises selecting waste plastics containing polyethylene and/or polypropylene and then passing the waste plastics through a pyrolysis reactor to thermally crack at least a portion of the polyolefin waste and produce a pyrolyzed effluent. The pyrolyzed effluent is separated into offgas, a naphtha/diesel fraction, a heavy fraction, and char. The naphtha/diesel fraction is passed to a crude unit in a refinery from which is recovered a straight run naphtha fraction (C<sub>5</sub>-C<sub>8</sub>) or a propane/butane (C<sub>3</sub>-C<sub>4</sub>) fraction. The straight run naphtha fraction, or propane and butane (C<sub>3</sub>-C<sub>4</sub>) fraction, is passed to a steam cracker for ethylene production. The ethylene is converted to normal alpha olefin and/or polyethylene. Also, a heavy fraction from the pyrolysis reactor can be combined with a heavy fraction of normal alpha olefin stream recovered from the steam cracker. The combined heavy fraction and heavy fraction of normal alpha olefin stream can be passed to a wax hydrogenation zone to produce wax.

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