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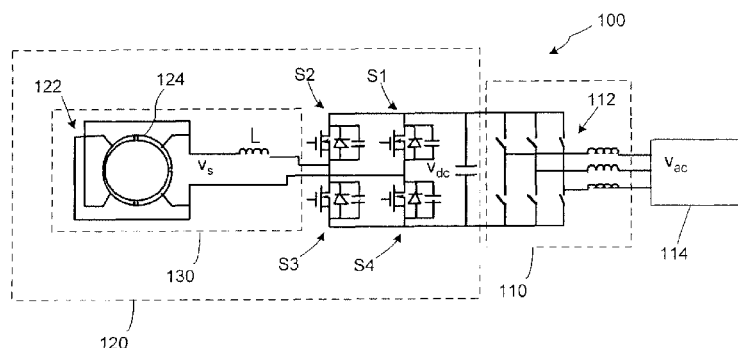


Figure 1

(57) **Abstract:** Provided herein is a fusion energy extraction circuit (FEEC) device having a grid-tied bidirectional converter and a resonant converter. The resonant converter can include an inverse cyclotron converter with two or more or quadruple plates and a plurality of circuit switches. The bidirectional converter can include a three-phase grid-tied converter. The FEEC device is capable of decelerating plasma particle beams, thereby extracting the energy from the deceleration, converting the extracted energy to electric energy, and sending the electric energy to a power grid.