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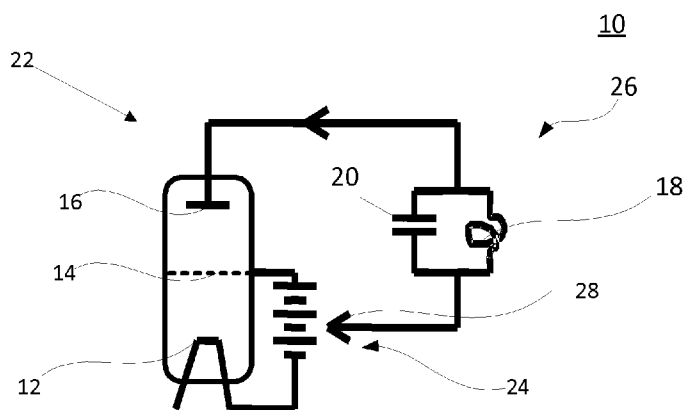


Fig. 1a

(57) Abstract: The invention relates to a device (10, 40, 60, 150) for generating electromagnetic THz radiation with free electron beams (54, 56, 78, 190, 192), comprising a dynatron tube (22), where the dynatron tube (22) comprises an electron source (12, 58, 72, 76, 96, 124, 200, 202), an extraction grid (14, 44, 68, 64, 82, 86, 188), an anode (16, 46, 70, 84, 102, 204, 206) preferably coated with a material composition for high secondary electron emission, which are arranged in vacuum, further the dynatron tube (22) is connected to a voltage supply (24, 52) supplying an extractor voltage and an anode voltage with the setting that the extractor voltage is higher than the anode voltage, an oscillator (26, 47, 66, 194, 196), which modulates the anode voltage and where the anode voltage is set to a work point voltage (30), and that the elements of the dynatron tube (22) are arranged in a way, that the oscillator voltage accelerates a positive primary current to the anode in one half of the voltage swing, and in the second half of the voltage swing, such a high primary current is accelerated that a secondary electron current is emitted from the anode to the extraction grid (14, 44, 68, 64, 82, 186, 188), which has twice the value of the primary current and therefore delivers a resulting current and charge flow in reverse direction to the primary current. The invention is characterized in that the dynatron tube (22, 40) is connected to two triode structures (182, 184) where the triode structures (182, 184) are connected in a way that an extraction voltage is fed

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to grids (186, 188) of the triode structures (182, 184) by the dynatron tube (22, 99, 130), wherein electrons are emitted as free electron beam (190) from the first triode structure (182) in a first half-wave of the voltage delivered from the oscillator of the dynatron, whereas the second triode structure (184) is connected to the oscillator voltage via a capacitor (194), which reverses the voltage controlling the emission of the second triode and this emits electrons as a free electron beam (192), in the now negative voltage drop of the second half wave of the oscillator voltage used as the extraction voltage in the second triode structure (184).