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(54) **Electron gun**

(57) The present invention pertains to an electron gun. The electron gun comprises an RF cavity having a first side with an emitting surface and a second side with a transmitting and emitting section. The gun is also comprised of a mechanism for producing an oscillating force which encompasses the emitting surface and the section so electrons are directed between the emitting surface and the section to contact the emitting surface and generate additional electrons and to contact the section to generate additional electrons or escape the cavity through the section. The section preferably isolates the cavity from external forces outside and adjacent the cavity. The section preferably includes a transmitting and emitting screen. The screen can be of an annular shape, or of a circular shape, or of a rhombohedron shape. The mechanism preferably includes a mechanism for producing an oscillating electric field that provides the force

and which has a radial component that prevents the electrons from straying out of the region between the screen and the emitting surface. Additionally, the gun includes a mechanism for producing a magnetic field to force the electrons between the screen and the emitting surface. The present invention pertains to a method for producing electrons. The method comprises the steps of moving at least a first electron in a first direction. Next there is the step of striking a first area with the first electron. Then there is the step of producing additional electrons at the first area due to the first electron. Next there is the step of moving electrons from the first area to a second area and transmitting electrons through the second area and creating more electrons due to electrons from the first area striking the second area. These newly created electrons from the second area then strike the first area, creating even more electrons in a recursive, repeating manner between the first and second areas.

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EUROPEAN SEARCH REPORT

Application Number  
EP 97 30 3476

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	MAKO F.M & PETER W: "A high-current micro-pulse electron gun" PROC: PARTICLE ACCELERATOR CONFERENCE, 17 - 20 May 1993, pages 2702-2704, XP002128262 ISBN: 0-7803-1203-1 * the whole document *	1,9	H01J3/02
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			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			H01J
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	20 January 2000	Colvin, G	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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