

(12) **EUROPEAN PATENT APPLICATION**

(21) Application number: 84850040.1

(51) Int. Cl.⁴: **H 01 J 25/38**

(22) Date of filing: 07.02.84

(30) Priority: 09.05.83 US 492522

(43) Date of publication of application:
14.11.84 Bulletin 84/46

(88) Date of deferred publication of search report: 09.04.86

(84) Designated Contracting States:
BE CH DE FR GB IT LI NL SE

(71) Applicant: **NATIONAL AERONAUTICS AND SPACE
ADMINISTRATION**
NASA Headquarters
Washington, D.C. 20546(US)

(72) Inventor: **Kosmahl, Henry Gottlob**
7419 River Road
Olmsted Ohio 44138(US)

(74) Representative: **Axelsson, Rolf et al,**
Kransell & Wennborg AB Sandhamnsgatan 42
S-115 28 Stockholm(SE)

(54) **Linearized traveling wave amplifier with hard limiter characteristics.**

(57) A traveling wave tube (10) has a helical slow wave structure (18) including a sever (21). A dynamic velocity taper is provided by gradually reducing the spacing (26) between the adjacent repeating elements of the slow wave structure, which are the windings of the helix. The reduction takes

place between Z_0 indicated by line (23) and Z_s which coincides with the output point of the helix as indicated by line (22). The spacing is decreased at an exponential rate up to about 5% at Z_s .

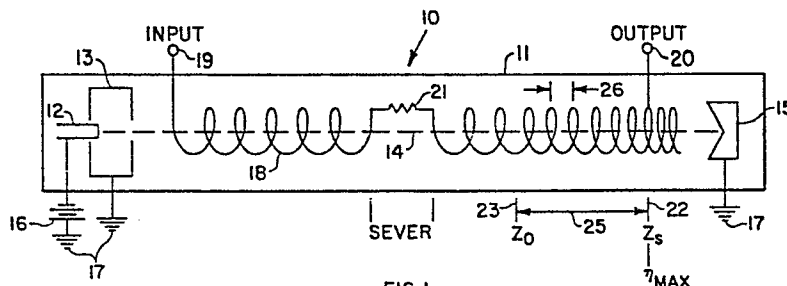


FIG. 1



European Patent
Office

PARTIAL EUROPEAN SEARCH REPORT
which under Rule 45 of the European Patent Convention
shall be considered, for the purposes of subsequent
proceedings, as the European search report

0125218

Application number

EP 84 85 0040

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. ³)		
X	US-A- 4 315 194 (D.J. CONNOLLY) * Abstract; figures * ---	1-8	H 01 J 25/38		
X	EP-A- 0 022 016 (THOMSON-CSF) * Abstract; figures * ---	1-8			
X	EP-A- 0 048 648 (THOMSON-CSF) * Abstract; figures * ---	1-8			
X	FR-A- 2 468 992 (THOMSON-CSF) * Whole document * ---	1-8			
A	A. LEBLOND: "LES TUBES HYPERFRE- QUENCES" Part I: "Principaux tubes les circuits", 1972; pages 132-135; Masson et Cie, Paris, FR ./.		<table border="1"> <thead> <tr> <th>TECHNICAL FIELDS SEARCHED (Int. Cl. ³)</th> </tr> </thead> <tbody> <tr> <td>H 01 J</td> </tr> </tbody> </table>	TECHNICAL FIELDS SEARCHED (Int. Cl. ³)	H 01 J
TECHNICAL FIELDS SEARCHED (Int. Cl. ³)					
H 01 J					
INCOMPLETE SEARCH The Search Division considers that the present European patent application does not comply with the provisions of the European Patent Convention to such an extent that it is not possible to carry out a meaningful search into the state of the art on the basis of some of the claims. Claims searched completely: 1-9 Claims searched incompletely: Claims not searched: Reason for the limitation of the search: Description and claims do not give any method to locate the point Zo.					
Place of search The Hague		Date of completion of the search 13-12-1985	Examiner LAUGEL		
CATEGORY OF CITED DOCUMENTS 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 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					



DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	Chapter IV-J.- "Puissance de sortie et rendement" * Whole document *	1-8	
	--- J.F. GITTINS: "POWER TRAVELLING-WAVE TUBES", 1965, pages 31-37; The English Universities Press Ltd. London, GB Chapter 2.3: "Large signal theories" Chapter 2.4: "On velocity tapers" * Whole document *	1-8	TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
A	J.E. ROWE: "NONLINEAR ELECTRON-WAVE INTERACTION PHENOMENA", 1965, pages 493-501; Academic Press, New York, US Chapter 4: "Results for travelling-wave amplifiers" * Whole document and figures 12, 13 *	1-8	
