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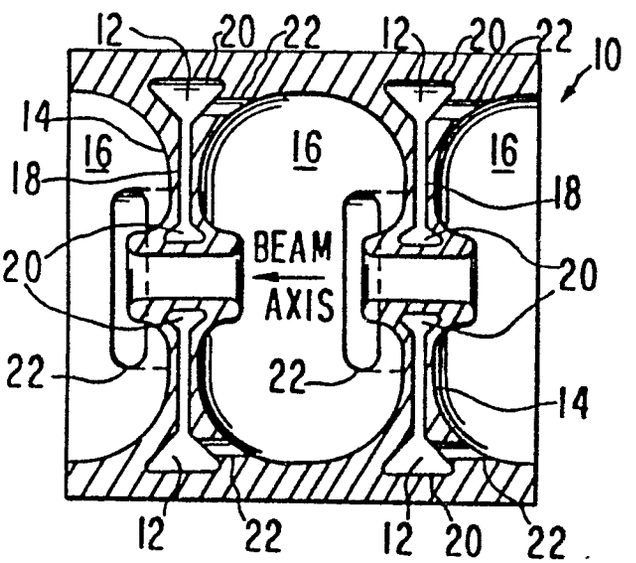
(54) Small diameter standing-wave linear accelerator structure.

(57) A compact, small diameter, standing-wave linear accelerator structure (10) suitable for industrial and medical applications is disclosed. The novel structure utilizes a new type of coupling cavity (12) for Pi/2 mode, standing-wave operation. The coupling cavity fits into the webs (14) between the accelerating cavities (16) substantially within the diameter of the accelerating cavities. This is made possible by keeping the center section (18) of the cavity thin to concentrate the electric field vector at the center of a section of the cavity and by enlarging the ends (20) of a section of the coupling cavity to accommodate the magnetic field vector. This structure offers a significant reduction in overall diameter over the side-coupled, annular ring, and existing coaxial coupled structures, while maintaining a high shunt impedance and large nearest neighbor coupling (high group velocity). A prototype 4 MeV, 36 cm long, S-band accelerator incorporating the new structure has been built and tested.



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EUROPEAN SEARCH REPORT

Application number

EP 86 30 3603

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.4)
A	US-A-3 953 758 (DUC TIEN TRAN) * Abstract; claim 1; figures 1,2 *	1,7	H 05 H 9/04 H 05 H 7/00
A,D	NUCLEAR INSTRUMENTS AND METHODS, vol. 193, 1982, pages 437-444, North-Holland Publishing Co., Amsterdam, NL; J.-P. LABRIE et al.: "The coaxial coupled linac structure" * "Coaxial coupled structure description"; figure 1 *	1,7	
A,D	IEEE TRANSACTIONS ON NUCLEAR SCIENCE, vol. NS-28, no. 3, June 1981, pages 3440-3444, IEEE, New York, US; S.O. SCHRIBER: "Accelerator structure development for room-temperature linacs" * "Coupled cavity linacs" *	1,7	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)
H 05 H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	16-09-1987	WINKELMAN, A.M.E.

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
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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

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