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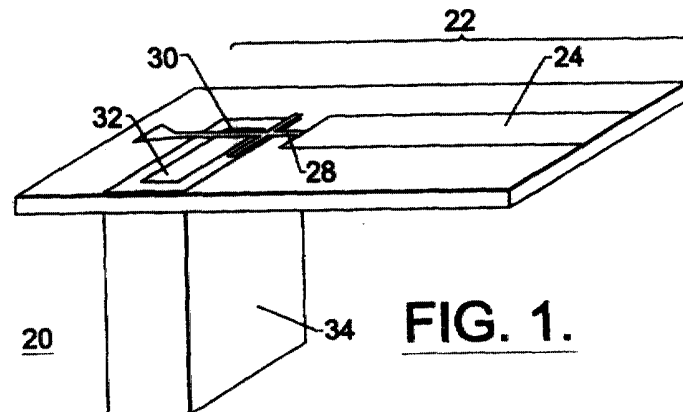
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(54) **MMIC-to-waveguide RF transition and associated method**

(57) An RF transition for coupling energy propagating in a waveguide transmission line into energy propagating in a monolithic microwave integrated circuit ("MMIC") is provided. The RF transition comprises a microstrip structure that includes a MMIC substrate with backside metallization and a front side microstrip. The backside metallization defines an iris, and the microstrip includes a microstrip feed formed proximate the iris. The RF transition also includes a waveguide terminating at the metallization layer around the iris to thereby convert energy propagating in the waveguide into energy propagating in the microstrip. In one embodiment, RF signal processing circuitry is monolithically formed on the

MMIC substrate. The invention enables a waveguide-to-MMIC transition to be constructed at higher RF frequencies, such as millimeter wave frequencies, even with the fragile, thinner substrates and smaller device features of higher-frequency devices. The monolithic structure avoids the use of wire bonds or ribbon welds to interconnect separate substrates, such as would be used in an MIC implementation, enabling improved RF performance at higher RF frequencies. The invention enables an RF circuit to be constructed that is adapted to communicate signals with a waveguide at higher RF frequencies, such as millimeter wave frequencies, in a rugged, producible package.



**FIG. 1.**



European Patent  
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EUROPEAN SEARCH REPORT

Application Number  
EP 00 20 2837

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.7)
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			H01P
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		17 January 2002	Den Otter, A
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	

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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