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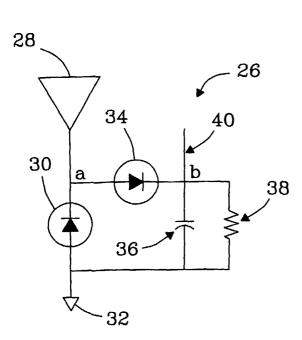
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(54) Title: ANTENNA MATCHING CIRCUIT



(57) Abstract: A matching circuit for use with radio frequency identification tag antennas configured for modulated backscatter, the circuit including a stub circuit coupled to a detector diode and an antenna and sized and shaped to match a predetermined frequency. The stub circuit is also designed to couple to the antenna such that a resulting phase is seen at the output, preferably 180° from that seen at the input. In addition, the stub circuit is structured to perform as an antenna, thus increasing the sensitivity of the overall circuit and maximizing efficiency and performance.

### INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 H03H7/38								
According to International Patent Classification (IPC) or to both national classification and IPC								
B. FIELDS								
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C. DOCUME	ENTS CONSIDERED TO BE RELEVANT							
Category °	Citation of document, with indication, where appropriate, of the rel	evant passages	Relevant to claim No.					
Υ	WO OO 67373 A (MARSH MICHAEL JOHN	N CAMILLE	1					
	;TROLLEY SCAN PTY LTD (ZA))		!					
	9 November 2000 (2000-11-09)	C.	F 7 0					
Α	page 7, line 18 -page 11, line 11 1-3	i; figures	5,7,9, 10,12,					
	1-5		18,19,					
			21,27,					
			28,30,31					
<b> </b>			_					
Υ	US 6 140 924 A (JOE JURIANTO ET	AL)	1					
,	31 October 2000 (2000-10-31) the whole document	)	F 7 0					
A	the whore document		5,7,9, 10,12,					
			15,16,					
			18,19,					
			21,24,					
			25,27,					
			28,30,31					
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Furth	ner documents are listed in the continuation of box C.	χ Patent family members are listed	in annex.					
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### INTERNATIONAL SEARCH REPORT

Iniormation on patent ramily members

Intern: Application No
PCT, US 02/06315

Patent document cited in search report		Publication date		Patent family member(s)	Publication date	
WO 0067373	А	09-11-2000	AU EP WO	4137200 A 1192713 A1 0067373 A1	17-11-2000 03-04-2002 09-11-2000	
US 6140924	Α	31-10-2000	SG	79961 A1	17-04-2001	