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(54) Compact balun for rejecting common mode electromagnetic fields

(57) A space-efficient broadband balun (20") comprising first mechanism (94, 96) for receiving an input signal (52, 54) having an undesirable component, wherein the undesirable component is a common mode component, said first mechanism (94, 96) comprising first (94) and second (96) coaxial waveguides; second mechanism (50, 78, 98) for rejecting the undesirable component via a waveguide transition (50, 78 98), wherein the waveguide transition (98) includes a dual coax-to-coplanar waveguide-to-single coax transition (98), wherein the coplanar waveguide is formed from a first slotline (114) and a second slotline (116), the first slotline (114) being formed between an outer conductor (122) and a center conductor (118) of an output coaxial cable (120) and between an outer conductor (110) and an inner conductor (112) of the first coaxial waveguide (94), and the second slotline being formed between an outer conductor (122) and a center conductor (118) of the output coaxial cable (120) and between the outer conductor (110) and the inner conductor (112) of the second coaxial waveguide (96), and the waveguide transition (98) includes a resistor network (100) to facilitate load matching; wherein an end of the coaxial output cable (120) provides an output of the balun (20), and the input signal (52, 54) includes a first input signal (52) and a second input signal (54), which are input at ends of the first (94) and second (96) coaxial waveguides the first input signal (52) and the second input signal (54) having a desired differential mode component and an undesired common mode component.

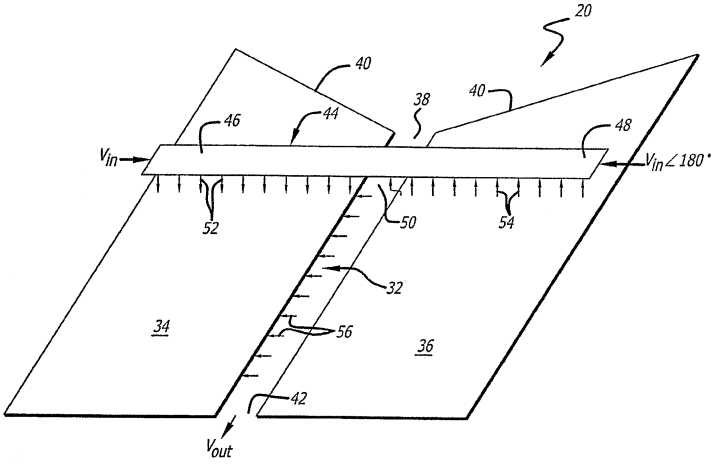

FIG. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 10 18 1791

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	US 3 784 933 A (SCHERER J ET AL) 8 January 1974 (1974-01-08) * column 2, line 35 - column 3, line 40; figures 1-3 *	1	

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 February 2011	Pastor Jiménez, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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EUROPEAN SEARCH REPORT

Application Number
EP 10 18 1791

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	JP 59 119902 A (FUJITSU LTD) 11 July 1984 (1984-07-11) * abstract; figure 1 * -----	7	
			TECHNICAL FIELDS SEARCHED (IPC)

The present search report has been drawn up for all claims

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claim: 1

Space-efficient broadband balun comprising a first and a second mechanism wherein the second mechanism includes a waveguide transition including a dual coax-to-coplanar waveguide-to-single coax transition and where a resistor network is included to facilitate load matching.

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2. claims: 2-11

Space-efficient broadband balun with a first and a second mechanism including a waveguide transition and wherein the transition is a single microstrip-to-slotline transition and wherein the slotline is terminated at a first end via a wedge in the ground plane.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 18 1791

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
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16-02-2011

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82