(19) Europäisches Patentamt
European Patent Office
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(11) EP 1 195 847 A3

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
15.05.2002 Bulletin 2002/20

(43) Date of publication A2:
10.04.2002 Bulletin 2002/15

(21) Application number: **01308496.7**

(22) Date of filing: **04.10.2001**

(51) Int Cl.[7]: **H01Q 9/04**, H01Q 15/00

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **04.10.2000 US 678128**
01.11.2000 US 704510

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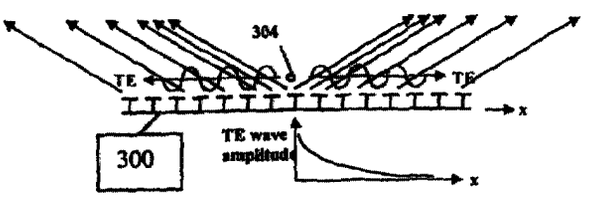
(54) **Multi-resonant, high-impedance surfaces containing loaded-loop frequency selective surfaces**

(57) An antenna system and an artificial magnetic conductor (300) include a frequency selective surface having a frequency dependent permeability μ_{1z} in a direction normal to the frequency dependent surface, a conductive ground plane (806), and a rodded media (808) disposed between the frequency selective surface and the conductive ground plane.



(b)

FIG. 3

EP 1 195 847 A3

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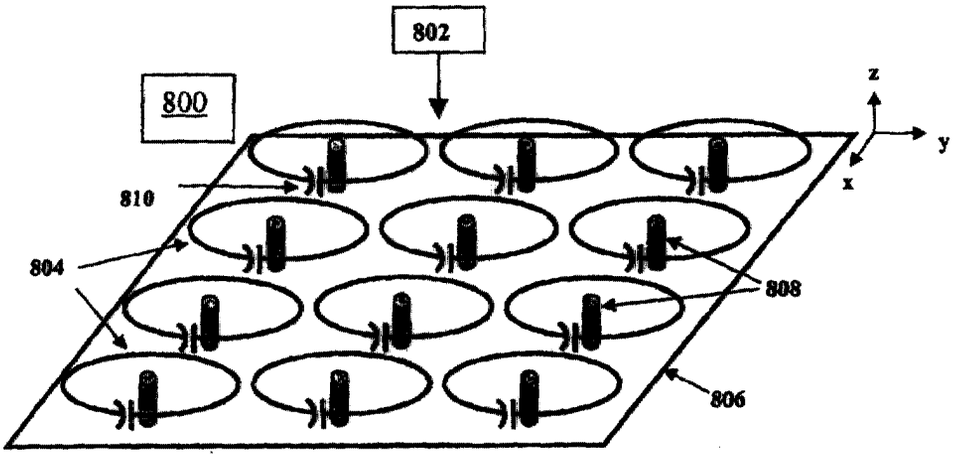

FIG. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 01 30 8496

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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A	SIEVENPIPER D ET AL: "HIGH-IMPEDANCE ELECTROMAGNETIC SURFACES WITH A FORBIDDEN FREQUENCY BAND" IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, IEEE INC. NEW YORK, US, vol. 47, no. 11, November 1999 (1999-11), pages 2059-2074, XP000865103 ISSN: 0018-9480 * abstract * --- -/--	12,16,17	H01Q

~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
MUNICH	26 March 2002	Johansson, R

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 01 30 8496

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. Claims: 1-6,7-10,11

   refer to an antenna system having a frequency dependent permeability in a direction normal to the frequency dependent surface.

2. Claim : 12

   refer to an artificial magnetic conductor with Lorenz resonances in transverse permittivity.

3. Claims: 13-15

   refer to an artificial magnetic conductor with permittivity and permeability tensors having non-zero elements in a main diagonal only.

4. Claims: 16-17

   refer to an artificial magnetic conductor with a transverse permittivity given by a particular mathematical expression.

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EUROPEAN SEARCH REPORT

Application Number
EP 01 30 8496

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)
A	KYRIAZIDOU C A ET AL: "NOVEL MATERIAL WITH NARROW-BAND TRANSPARENCY WINDOW IN THE BULK" IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, IEEE INC. NEW YORK, US, vol. 48, no. 1, January 2000 (2000-01), pages 107-116, XP000908642 ISSN: 0018-926X * abstract * -----	12,16,17	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
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26-03-2002

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