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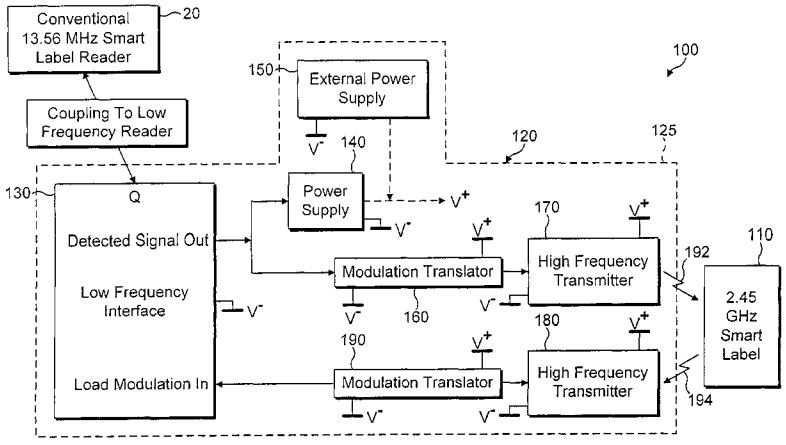
Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

[Continued on next page]

(54) Title: READER INTERFACING DEVICE



(57) Abstract: The invention provides a reader interfacing device (120) for providing a communication path between: (a) a tag or smart label reader (20) configured to emit and receive interrogating radiation suitable for interrogating tags or smart labels (40) at a first radiation frequency; and (b)a remote tag or smart label (110) configured to be interrogated using radiation of a second frequency, the first frequency (13.56 MHz) and the second frequency (2.45 GHz) being mutually different by at least an order of magnitude, and the reader (20) being operable to communicate through the device (120) to the remote tag or smart label (110). The device (120) includes a power supply (140) for converting interrogating radiation received at the device from the reader to generate power supply potentials for powering the device (120). Moreover, the device (120) is mutually magnetically coupled to the reader (20) for receiving the interrogating radiation therefrom and for providing a modulated load thereto for communicating back to the reader (20). In order to achieve such magnetic coupling, the device (120) includes a loop antenna (310) for magnetically coupling to a corresponding loop antenna (60) of the reader. The device (120) provides, for example, the advantage that the reader (20) can conform to a standard ISO 15693 and the device (120) enables remote tags and smart labels not conforming to the standard to communicate with the reader (20).

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

Inter ıal Application No
PCT/GB 03/02846

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06K19/07 G06K7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G06K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 209 615 A (ADVANCED MICROWAVE ENGINEERING) 29 May 2002 (2002-05-29) column 3, line 3 -column 4, line 18 column 7, line 4 - line 11 figure 1	1,14
Y	column 1, line 28 - line 38	2
A	---	3-8
Y	OBRIST B ET AL: "A microwave powered data transponder" SENSORS AND ACTUATORS A, ELSEVIER SEQUOIA S.A., LAUSANNE, CH, vol. 46, no. 1-3, January 1995 (1995-01), pages 244-246, XP004303489 ISSN: 0924-4247 the whole document	2
A	---	1,3-12
	-/--	

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
4 November 2003	23.02.04

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Berger, C

Form PCT/ISA/210 (second sheet) (July 1992)

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 485 154 A (BROOKS DAVID R ET AL) 16 January 1996 (1996-01-16) column 3, line 11 - line 22 column 4, line 56 -column 6, line 44 figures 1A-D ---	1-8, 14-16
A	EP 0 347 894 A (OKI ELECTRIC IND CO LTD) 27 December 1989 (1989-12-27) abstract; figure 2 -----	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 03/02846

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-12, 14-16

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-12,14-16

   Claim 1 and its dependent claims refer to an interface device for providing a communication path between a) a reader working at a first frequency and b) a remote tag or smart label working at a second frequency.

2. Claim : 13

   Claim 13 concerns a remote tag or smart label incorporating amplifying means for reflectively amplifying a received signal.

INTERNATIONAL SEARCH REPORT

formation on patent family members

Inter nal Application No
PC1/GB 03/02846

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