Title: SMART RADIO FREQUENCY IDENTIFICATION (RFID) ITEMS

Abstract: Methods, systems, and apparatuses for radio frequency identification (RFID) items/objects are described. In embodiments of the present invention, resonant frequency characteristics of materials of the items/objects are used to enable RFID functionality in the items/objects. In an aspect of the present invention, a RFID item comprises a resonant material. An integrated circuit (IC) die is electrically coupled to the resonant material. The resonant material functions as an antenna for the IC die. The IC die may be attached to a quadraposer substrate to be electrically coupled to the resonant material.
# INTERNATIONAL SEARCH REPORT

**A. CLASSIFICATION OF SUBJECT MATTER**

**IPC:**
- G06H 13/14 (2006.01)
- H01Q 21/08 (2006.01); H01Q 1/12 (2006.01)

**USPC:**
- 340/572.7, 572.8, 343/718, 824; 705/28, 29, 16, 17, 18

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

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**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)
- U.S.: 340/572.7, 572.8, 343/718, 824; 705/28, 29, 16, 17, 18

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 practicable, search terms used)

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**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tr>
<td>X</td>
<td>US 6,320,509 (Brady et al.) 20 November 2001, column 1, lines 38-47; column 4, lines 19-25 and 57-60; columns 12-14, Figures 13B, 15A</td>
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<td>X</td>
<td>US 6,162,550 (Pinchen et al.) 19 December 2000, column 2, lines 30-40; col 6, ins 36-40; col 12, ins 5-17; Figures 9a-9l</td>
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<td>X</td>
<td>US 6,400,271 (Davies, Jr. et al.) 04 June 2002, column 1, lines 15-21; col 6, ins 53-67</td>
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<td>12,14-18, 24</td>
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<td>A</td>
<td>US 5,030,962 (Rees) 09 July 1991, figures 8-10 and 21</td>
<td>19 and 30</td>
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<td>&amp;</td>
<td>US 6,437,985 (Blanc et al.) 20 August 2002, figures 10 and 11</td>
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Further documents are listed in the continuation of Box C.

- **Special categories of cited documents:**
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  - "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  - "O" document referring to an oral disclosure, use, exhibition or other means
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- **Special categories of cited documents:**
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  - "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**
14 March 2008 (14.03.2008)

**Date of mailing of the international search report**
21 MAR 2008

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**Telephone No.** (571) 259.9864

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<td>&amp;</td>
<td>US 2004/0064362 (Rosenfeld) 01 April 2004, paragraphs 0048-0051</td>
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