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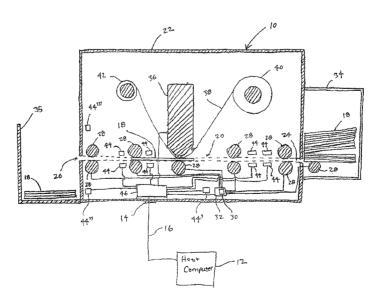
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(54) Title: A PRINTER AND ENCODER SYSTEM AND ASSOCIATED ANTENNA-COUPLER



(57) Abstract: A RFID system and an associated antenna-coupler are provided. The system may be for selectively communicating with a targeted transponder from among a group of multiple adjacent transponders is provided. The system may include a transponder conveyance, a transceiver, and an antenna-coupler. The transponder conveyance is adapted to transport at least one targeted transponder from a group of multiple adjacent transponders through a transponder operating region. The transceiver is configured to generate one or more electrical signals. The antenna-coupler has first and second microstrips in a cross-like arrangement relative to each other. Each of the first and second microstrips is configured to transmit one or more electro-magnetic fields concentrated in a near-field region of the antenna-coupler based on the one or more electrical signals for communicating with the targeted transponder.



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A. CLASSIFICATION OF SUBJECT MATTER INV. G06K17/00 B41J2 B41J29/393 H01Q9/04 H01Q9/28 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) G06K B41J H01Q 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, WPI Data C. DOCUMENTS CONSIDERED TO BE RELEVANT Category\* Citation of document, with indication, where appropriate, of the relevant passages Relevant to claim No. X US 5 689 239 A (TURNER LEIGH HOLBROOK [SG] 1-4.7-10ET AL) 18 November 1997 (1997-11-18) Υ column 1, line 4 - line 10 column 3, line 22 - line 33 column 7, line 18 - column 8, line 47 US 2005/058483 A1 (CHAPMAN THEODORE A [US] X 21 - 24ET AL) 17 March 2005 (2005-03-17) 1,25 paragraph [0024] - paragraph [0027] paragraph [0030] - paragraph [0032] paragraph [0037] paragraph [0040] - paragraph [0044] Further documents are listed in the continuation of Box C. See patent family annex. Special categories of cited documents: \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the "A" document defining the general state of the art which is not considered to be of particular relevance earlier document but published on or after the international \*X\* document of particular relevance; the claimed invention filing date cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "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) "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 docu-"O" document referring to an oral disclosure, use, exhibition or other means ments, such combination being obvious to a person skilled document published prior to the international filing date but later than the priority date claimed "&" document member of the same patent family Date of the actual completion of the international search Date of mailing of the international search report 2 April 2008 18/04/2008 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 Geiger, Hans-Walter

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PCT/US2007/079172

| C(Continua  | cion). DOCUMENTS CONSIDERED TO BE RELEVANT   | 007/079172            |  |  |  |  |  |  |
|-------------|--|-----------------------|--|--|--|--|--|--|
| Category*   | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |  |  |  |  |  |  |
| Υ           | US 5 280 286 A (WILLIAMSON JOHN D [US]) 18 January 1994 (1994-01-18) column 2, line 5 - line 10 column 3, line 41 - line 54  | 1                     |  |  |  |  |  |  |
| X .         | W0 2006/035881 A (TOTO LTD [JP]; TSUB0I<br>HIROSHI [JP]; IWATA KENGO [JP]; ABE<br>TOMOYUKI [JP) 6 April 2006 (2006-04-06)<br>paragraph [0165] - paragraph [0168]<br>& EP 1 804 335 A (TOTO LTD [JP])<br>4 July 2007 (2007-07-04) |                       |  |  |  |  |  |  |
| Y<br>X<br>Y |  |                       |  |  |  |  |  |  |
|             | paragraph [0165] - paragraph [0168]  | 0,25                  |  |  |  |  |  |  |
| A           | WO 2005/022445 A (ZIH CORP; DONATO DANIEL F [US]; GAWELCZYK ROBERT [US]; HOHBERGER CLIVE) 10 March 2005 (2005-03-10)   | 1-31                  |  |  |  |  |  |  |
|             | page 5 - page 19<br>   |                       |  |  |  |  |  |  |
| Α           | US 2006/000907 A1 (FORSTER IAN J [GB])<br>5 January 2006 (2006-01-05)<br>paragraph [0024] - paragraph [0060]   | 1-31                  |  |  |  |  |  |  |
|             |  |                       |  |  |  |  |  |  |
|             |  |                       |  |  |  |  |  |  |
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| :           |  |                       |  |  |  |  |  |  |

#### INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2007/079172

| Patent document cited in search report |    |            | Publication date |            | Patent family member(s) |             | Publication date |            |
|--|----|------------|------------------|------------|-------------------------|-------------|------------------|------------|
|  | US | 5689239    | Α                | 18-11-1997 | AT                      | 180084      |                  | 15-05-1999 |
|  |    |            |                  |            | WO                      | 9305489     | –                | 18-03-1993 |
|  |    |            | •                |            | DE                      | 69229176    |                  | 17-06-1999 |
|  |    |            |                  |            | EP                      | 0603279     | Al<br>           | 29-06-1994 |
|  | US | 2005058483 | <b>A</b> 1       | 17-03-2005 | CN                      | 1867451     | Α                | 22-11-2006 |
|  |    |            | • , .            | •          | US                      | 2005276647  |                  | 15-12-2005 |
|  |    | •          | •                |            | US                      | 6929412     |                  | 16-08-2005 |
|  |    |            |                  |            | US                      | 6899476     | B1               | 31-05-2005 |
|  | US | 5280286    | A                | 18-01-1994 | NON                     | E .         |                  |            |
|  | WO | 2006035881 | Α                | 06-04-2006 | EP                      | 1804335     | A1               | 04-07-2007 |
|  |    | •          |                  |            | KR                      | 20070051928 | Α                | 18-05-2007 |
|  |    |            |                  |            | TW                      | 273743      | В                | 11-02-2007 |
|  | EP | 1804335    | A                | 04-07-2007 | WO                      | 2006035881  | A1               | 06-04-2006 |
|  |    |            |                  |            | KR                      | 20070051928 | A.               | 18-05-2007 |
|  |    |            | ·                | *          | TW                      | 273743      | В                | 11-02-2007 |
|  | WO | 2005022445 | <br>А            | 10-03-2005 | EP.                     | 1660331     | A2               | 31-05-2006 |
|  |    |            |                  |            | TW                      | 250460      |                  | 01-03-2006 |
|  | US | 2006000907 | <br>A1           | 05-01-2006 | CA                      | 2572466     | A1               | 19-01-2006 |
|  |    |            |                  | •          | CN                      | 1989508     | Α .              | 27-06-2007 |
|  |    |            |                  |            | . EP                    | 1754177     | A1               | 21-02-2007 |
|  |    |            |                  |            | KR                      | 20070027647 | Α                | 09-03-2007 |
|  |    |            |                  |            | WO                      | 2006007519  | A1               | 19-01-2006 |