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GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,  
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GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent  
(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,  
NE, SN, TD, TG).

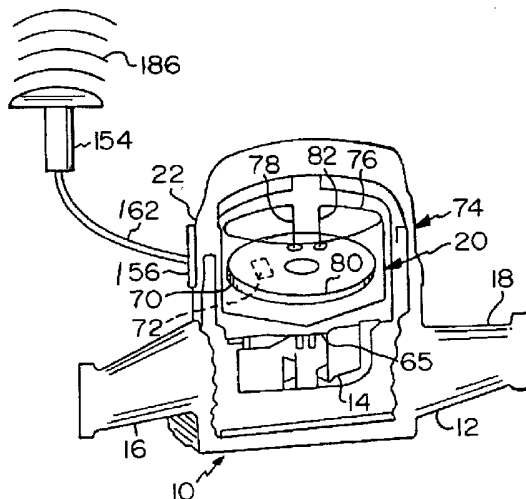
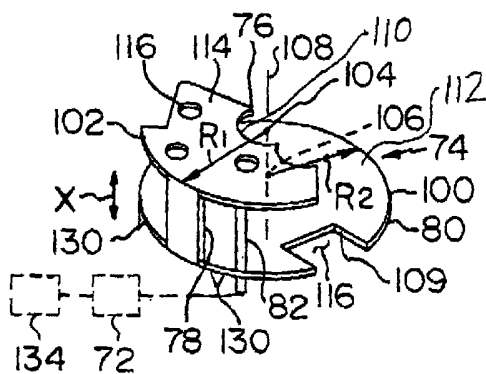
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For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: METER REGISTER AND ANTENNA



(57) Abstract: A meter register includes a register body having a rotatable drive shaft coupled thereto. A drive gear is attached to the drive shaft and at least one follower gear is rotatably attached to the register body and coupled with the drive gear. An antenna is provided that includes a first electrically conductive sheet, a second electrically conductive sheet, and an axially extending leg electrically connected to the first electrically conductive sheet and the second electrically conductive sheet. A first electrically conductive sheet is spaced an axial distance away from the second electrically conductive sheet wherein at least a portion of the register body is sandwiched between the first electrically conductive sheet and the second electrically conductive sheet. The meter register can be attached to a meter body and, further, an auxiliary antenna can be attached to the meter register. Also disclosed is a method of operation of a utility measuring system that incorporates the above-described meter register.

# INTERNATIONAL SEARCH REPORT

International Application No.  
PCT/IL 02/00181

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H01Q9/04 H01Q1/22 H01Q1/04 G01F15/06 G08C17/02

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 H01Q G01F G08C

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, INSPEC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 123 758 A (SHIBANO YOSHIZO ET AL) 31 October 1978 (1978-10-31)  column 1, line 64 -column 2, line 10 column 3, line 34 -column 5, line 26; figures 1-6	1-7, 9-12, 23-28
X	US 2 996 713 A (BOYER JOSEPH M) 15 August 1961 (1961-08-15) column 2, line 23 - line 60; figures 5,6  -/--	1

☒ Further documents are listed in the continuation of box C.

☒ 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

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"P" document published prior to the international filing date but later than the priority date claimed

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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

16 October 2002

Date of mailing of the international search report

24. 10. 02

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/IL 02/00181

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KUGA N ET AL: "CIRCULAR PATCH ANTENNAS MINIATURIZED BY SHORTING POSTS" ELECTRONICS & COMMUNICATIONS IN JAPAN, PART I - COMMUNICATIONS, SCRIPTA TECHNICA. NEW YORK, US, vol. 79, no. 6, 1 June 1996 (1996-06-01), pages 51-58, XP000588953 ISSN: 8756-6621 page 51, left-hand column; figure 1 ---	1
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A	DE 197 25 247 A (KUNDO SYSTEMTECHNIK GMBH) 17 December 1998 (1998-12-17) column 2, line 43 -column 6, line 45; figures 1-3 ---	29-38, 44-46 63-65
Y	US 6 115 677 A (PERTHOLD RAINER ET AL) 5 September 2000 (2000-09-05) column 3, line 5 -column 4, line 5; figures 1,2 ---	29,44
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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/IL 02/00181

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 748 104 A (PHILLIPS MARC ET AL) 5 May 1998 (1998-05-05)	48-50, 52,53, 55-57,61 59,60
Y	column 3, line 66 -column 6, line 2; figure 1 column 7, line 40 - line 61 column 11, line 9 - line 28; figure 2 ---	
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X	WO 99 49680 A (WARFEL KARL B ;SHAND ARTHUR M (US); WHITLEY KEVIN T (US); BELLSOUT) 30 September 1999 (1999-09-30) page 1, line 13-16 page 4, line 12 - line 16 page 15, line 25 -page 16, line 8; figures 1-3 ---	48,55-58
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Y	GB 2 123 556 A (METAL IND LIMITED) 1 February 1984 (1984-02-01)	63-65
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A	US 5 259 251 A (BRINSTER DANIEL ET AL) 9 November 1993 (1993-11-09) column 2, line 15 -column 4, line 49; figures 1,2 ---	63-65
A	EP 1 079 207 A (BREED AUTOMOTIVE TECH) 28 February 2001 (2001-02-28) the whole document -----	63

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IL 02/00181

## 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.:

### 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: 1-28

PIFA antenna, comprising a first and second electrically conductive sheets connected by an axially extending leg (Group 1)

2. Claims: 29-40, 44-47, 63-65

A meter comprising a register body having a rotatable drive shaft coupled thereto and a drive gear attached to the drive shaft, and at least one follower gear rotatably attached to the register body and a PIFA antenna, a portion of the register body being sandwiched between the top and bottom conductive sheets of the PIFA antenna. (Group 2)

2.1 Claims 63-65

A meter comprising a register body having a rotatable drive shaft coupled thereto and a drive gear attached to the drive shaft, and at least one follower gear rotatably attached, a sensing follower gear coacting with the drive gear and provided with a magnet, and first and second magnetically activated switches, the rotational direction of the sensing follower being determined by a monitoring sequence of the operating states of the switches. (Group 3)

3. Claims: 41-43

Antenna adapter comprising a circular metallic ring connected to a first and second electrically conductive sheets spaced from each other, the circular metallic ring being adapted to be secured to an exterior portion of a meter register (Group 4)

4. Claims: 48-62

Method for measuring a utility comprising providing a meter and a meter register, transmitting a signal from the meter register identifying the meter-type identification code and utility consumption, and receiving this information by a central authority (Group 5)

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IL 02/00181

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Information on patent family members

International Application No

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