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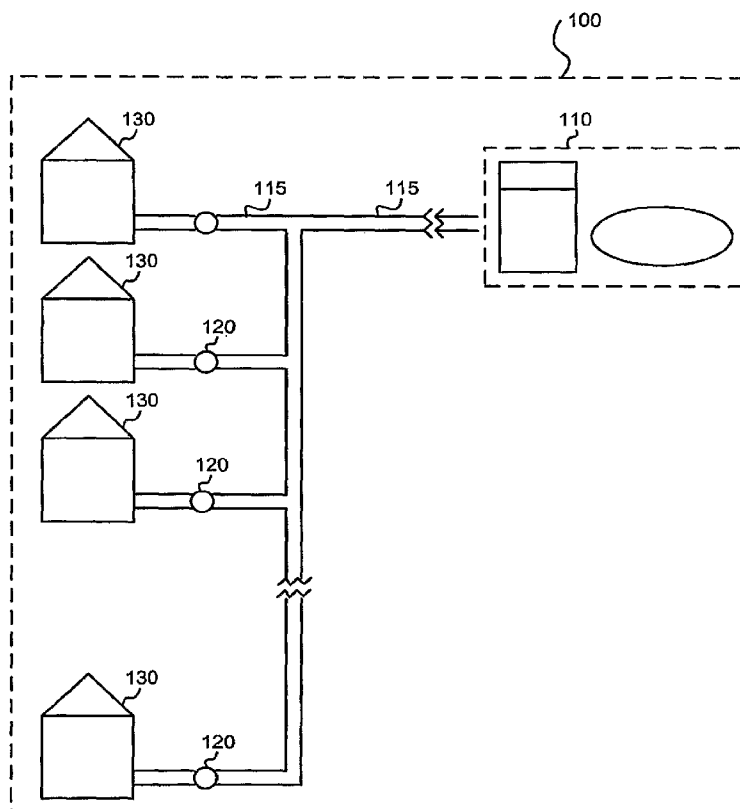
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(54) Title: SYSTEMS AND METHODS FOR REMOTE UTILITY METERING AND METER MONITORING



(57) Abstract: A remote water meter monitoring system is provided. A mesh network-type transceiver unit is coupled to a water meter housing having a water counting mechanism inside to transmit water consumption information as well as other sensor information, such as backflow detection, water pressure, and water metrics (e.g., residual chlorine and temperature) to a central server system via a bridge device and a corresponding mesh network. Mechanical energy from the water flowing through the water meter housing is converted to electrical energy via an energy conversion unit. An electrically powered shut off valve is remote addressable via the transceiver unit.



GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/13505

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G08B 23/00 (2007.10)

USPC - 340/870.02

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)

USPC: 340/870.02

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

USPC: 340/853.1, 853.8, 870.01, 870.02; 455/405, 414.1, 418; 709/203, 223, 238; 700/91, 108, 266 (text search - see terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PubWEST(USPT,PGPB,EPAB,JPAB); DialogPRO(Engineering); Google Scholar

Search Terms Used: remote utility metering, meter monitoring, bidirectional flow rate, power generator, shutoff valve, reverse flow, water quality etc.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2006/0114121 A1 (CUMERALTO et al.) 01 June 2006 (01.06.2006) (Fig.1, abstract, para [0004], para [0007], para [0016], para [0019]-[0021], para [0024]-[0027], para [0029]-[0030], para [0037])	13 and 15
Y		1-12, 14, and 16-20
Y	US 2005/0212710 A1 (WINTER) 29 September 2005 (29.09.2005) (para [0040]-[0041], para [0051], para [0056]-[0058], para [0062])	1-12, 14, and 16-20
Y	US 2006/0045105 A1 (DOBOSZ et al.) 02 March 2006 (02.03.2006) (para [0118]-[0120], para [0143])	10 and 18
A	US 6,327,541 B1 (PITCHFORD et al.) 04 December 2001 (04.12.2001)	1-20

☐ Further documents are listed in the continuation of Box C.

* 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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"O" document referring to an oral disclosure, use, exhibition or other means

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

"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 invention

"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

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